8-2009

The Reintroduction of Heritage Streetcars and the Related Effects of Community Identity and Social Interaction with the Residents in Streetcar-Oriented Developments

Robert Benedict
Clemson University, RCBENED@aol.com

THE REINTRODUCTION OF HERITAGE STREETCARS AND THE RELATED EFFECTS OF COMMUNITY IDENTITY AND SOCIAL INTERACTION WITH THE RESIDENTS IN STREETCAR-ORIENTED DEVELOPMENTS

A Dissertation
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy
Environmental Design and Planning

---

by
Robert Creighton Benedict
August 2009

Accepted by:
Dr. Barry Nocks, Committee Chair
Dr. Anne Dunning
Dr. Cliff Ellis
Dr. Terry Farris

ABSTRACT

Heritage streetcars have increasingly drawn the attention of planners and transit officials as an alternative mode of public transit that complements the economic development and tourism strategies of numerous cities. Advocates have touted the benefits of heritage streetcars as a circulator transit mode while promoting a compact, pedestrian-friendly environment with many urban revitalization efforts. As a character-defining mode of public transit, heritage streetcars have been reintroduced as a redevelopment approach that enables a community to restore a significant component of its heritage while facilitating development activity near streetcar routes. Heritage streetcars advance this strategy by evoking a sense of nostalgia and fostering a new heritage tourism strategy. Less tangible are the positive effects upon the social infrastructure of the residents in the streetcar-oriented developments and the perceived effects of heightened community identity.

This study was undertaken to provide a clearer understanding of the attitudes and perceptions of the residents in streetcar-oriented neighborhoods towards heritage streetcars. Do heritage streetcars play an important role fostering a heightened sense of community identity and help build social capital among residents? What are the physical characteristics of heritage streetcars that are favored or disliked by the residents and does their travel behavior contribute to a greater sense of community identity and social interaction? As an exploratory study, the research examined these questions through a survey and follow-up interviews that were administered to a sample of residents in streetcar-oriented developments and neighborhoods within the study sites of Memphis

and Little Rock/North Little Rock. Both markets have reintroduced heritage streetcar service with significant development activity including extensive downtown housing growth near the streetcar routes. Although the reintroduction of heritage streetcars is but one factor that has contributed to the economic revitalization of Memphis and Little Rock/North Little Rock, heritage streetcars have become a distinctive symbol of the economic growth within the community. The results of the study are expected to shed light on the effects of heritage streetcars on the neighboring residential communities and enable developers, planners and transit officials to better understand buyer and renter motivations for the residents in streetcar-oriented developments.

ACKNOWLEDGEMENTS

I would like to extend my deepest gratitude to my dissertation committee for their ongoing support and advice throughout the preparation of this dissertation. My advisor, Dr. Barry Nocks, provided valued encouragement and insight that enabled me to clarify my research objectives and maintain the proper focus on the methodology. The contributions of my other committee members consisting of Dr. Anne Dunning, Dr. Cliff Ellis and Dr. Terry Farris were also considerable as their constructive suggestions and direction encouraged me to pursue deeper research into the related disciplines of public transit, urban planning and real estate development. I owe Dr. Farris a special thank you as without him I would not have been in the doctoral program at Clemson.

Dr. Jeff Hallo provided valuable assistance reviewing my survey design and Dr. Jeff Hoomani was gracious with his time and advice regarding the statistical analysis. As my brother-in-law, Dr. Hoomani always placed professionalism above family considerations with his assistance.

I would also like to thank John Lancaster of Memphis Area Transit who was always accessible for my numerous questions and requests for essential background information. Betty Vineland, Eric Meyerson and Virginia Fry with Central Arkansas Transit System were also very helpful and never hesitated to provide requested information regarding their operations.

Finally, I would like to thank my wife, Judy, and my daughters, Alexis and Hayley, for their support and patience throughout my doctoral education. Without their

understanding and sacrifices, I would not have completed this dissertation. They are the light of my life with their unconditional love and understanding.

TABLE OF CONTENTS

Table of Contents (Continued)

Page

Table of Contents (Continued)

LIST OF TABLES

List of Tables (Continued)

Table Page

List of Tables (Continued)

Table Page

LIST OF FIGURES

List of Figures (Continued)

Figure Page

CHAPTER I

INTRODUCTION

The reintroduction of streetcars has emerged in recent decades as an increasingly popular economic development and heritage tourism strategy. As an alternative form of public transit, streetcars are proving to be more cost-efficient and environmentally-friendly than other modes of transit such as motor buses, considered to be the successor form of public transit to streetcars (Poticha & Ohland, 2007). Although transit-oriented development has become an established development strategy with heavy and light-rail commuter systems, the use of heritage streetcars represents a relatively new redevelopment approach. The American Public Transportation Administration (APTA) defines "heritage" streetcars as a replica car that closely resembles the trolley design from the first half of the 20th century as distinguished from "vintage" streetcars which are preserved, historic streetcars that have been restored for current use (Kimley-Horn, 2007). Within the context of this study, heritage streetcars are referenced as an inclusionary term for the streetcar systems in the study sites although the Memphis system utilizes both heritage and vintage streetcars.

As a character-defining mode of public transit, heritage streetcars have been reintroduced as a strategy that enables a community to restore a significant component of its heritage while facilitating transit-oriented development. The reintroduction of heritage streetcars advances this strategy by evoking a sense of nostalgia and fostering a new heritage tourism strategy. The increased tourism associated with streetcars enhances transit-oriented development with additional demand for retail, entertainment and dining

opportunities (Weyrich & Lind, 2002). Less tangible are the positive effects upon the social infrastructure of the residents in the streetcar-oriented developments and the perceived effects of heightened community identity. The reintroduction of trolley service resurrects a character-defining attribute of the community with the potential for an increased sense of attachment and greater social interaction. This study examines whether the physical characteristics of heritage streetcar systems foster enhanced community identity and the effects of streetcar service upon the social interaction of the residents of the related transit-oriented developments in the study sites of Memphis and Little Rock/North Little Rock that have reintroduced streetcar service with significant development activity.

Research Questions and Conceptual Framework

Streetcars, a ubiquitous form of public transit in America during the early twentieth century, have increasingly gained momentum in recent years with the reintroduction of service in twenty-five cities (Wilson, 2006) and planned service in approximately thirty additional cities (Poticha & Ohland, 2007). Although still largely perceived as a visitor amenity, the re-emergence of streetcar service has been a catalyst for the revitalization of deteriorated urban areas and inner-ring suburbs. Streetcar advocates attribute the increased residential activity associated with transit-oriented developments to be largely driven by property owners and tenants desiring to reduce their automobile dependency, and decrease their commute time to work. Economic development advocates of streetcars point out their effectiveness as a value capture strategy by increasing property values and business activity (Ohland & Poticha, 2007).

In addition to the perceived economic benefits, there are less obvious social outcomes that are being derived from the reintroduction of streetcars. Streetcars may allow some individuals to reconnect with the historic character of a community or to utilize a unique amenity that enhances the social outcomes of residing in adjoining neighborhoods. Through the reintroduction of heritage streetcar car service, a community may restore a significant component of its heritage that was lost with the expansion of its urban core outward to the inner-ring suburbs.

Heritage streetcars provide a tangible link to that era and have enabled people to once again discover a lifestyle prior to the encumbrances of the automobile. Although there has been a substantial body of research focused on the core ideas of transit-oriented development, the re-emergence of heritage streetcar service and its related impact upon transit-oriented development has not generated significant, scholarly research. There is extensive promotional literature that is useful to advocates of streetcars and city planners. Heritage streetcars also represent a phenomenon that has gained considerable exposure in the popular media and the attention of numerous cities contemplating future service. However, a more rigorous examination of the effects of heritage streetcars upon social interaction and as a symbol of community can be beneficial to planners and developers by gaining a clearer understanding of this phenomenon.

This study explores whether the reintroduction of streetcars leads to increased social interaction and promotes active environments leading to heightened community identity. The study also examines how social interaction and community identity in streetcar-oriented developments are engendered by the physical characteristics of a

heritage streetcar system that create a distinctive image of a community's past thus invoking a unique form of attachment. Research questions that will be addressed are:

- Do residents of streetcar-oriented developments have a heightened sense of community identity and attachment with heritage streetcars as distinctive symbols of the community?
- Do the residents of streetcar-oriented developments have a greater sense of social interaction with their neighbors? The basis of comparison shall be where the residents previously lived.
- What aspects of the physical characteristics of a heritage streetcar system foster feelings of enhanced attachment and community identity?

To explore these questions, study sites were selected in Little Rock, North Little Rock and Memphis with mailed questionnaires to residents in fifteen, streetcar-oriented developments and neighborhoods. Residents were asked specific questions about a perceived sense of community identity related to heritage streetcars and social activities associated with the streetcar. Additionally, follow-up interviews for further insight were conducted with survey respondents, real estate developers, transit officials and planners who have been actively involved in the development or planning of streetcar-oriented developments.

The review of the literature in this dissertation draws from the domains of community identity and social interaction to develop a conceptual framework within the context of residents' perceptions. This framework provided the research design for a mixed-methods methodology for the subject dissertation.

Overview of the Chapters

The literature review in Chapter II provides the theoretical dimensions of the study and reviews the concepts of community identity and social interaction. The domains of community identity and social interaction draw from the literature within the fields of urban planning, community psychology and architecture.

The research methodology, including the research design strategy, descriptions of the study sites and data-collection techniques, is detailed in Chapter III. Chapter IV provides the findings of the research with the use of descriptive statistics summarizing the survey research and pertinent insight gathered from follow-up interviews. The final chapter includes the conclusions of the research, implications, limitations and the potential for future research.

CHAPTER II

LITERATURE REVIEW

The broad scope of literature on transit-oriented development in the United States provides an overarching framework for the research that is pertinent to the reintroduction of heritage streetcars and the social behavior of residents in streetcar-oriented developments. The core ideas of transit-oriented development cover a wide range of research that includes the quantitative analysis of economic costs and benefits, the relationship of transit-oriented development and property values, aesthetic considerations and social aspects. Despite the growing range of research infrastructure, most of the research has focused on light-rail and commuter rail transit as a catalyst for transit-oriented development. The recent emergence of heritage streetcar service and its related impact upon transit-oriented development has not generated significant, scholarly research. This literature review includes literature directly related to the reintroduction of heritage streetcars as well as related literature on transit-oriented development that offers the underpinning for this research proposal.

Literature on the History of Streetcars

A historic perspective within the literature provides the foundation for the research since the reintroduction of heritage streetcars is not a new concept. Mohl touted streetcars as "the most significant technological advancement in urban transit in the mid-19th century" (Mohl, 1985). Urban spatial patterns in large cities were changing rapidly as a result of a new form of transit known as the horse-drawn omnibus. The increased

mobility from this early form of mass-transit soon affected growth patterns thus enabling persons to reside at a distance from their place of business in more healthy locations, without the loss of time and fatigue of walking (Mohl, 1985).

The streetcar business was further transformed with former Navy ensign Frank Sprague's design for electric traction. Inspired after seeing the latest electric devices at the 1882 Crystal Palace Exhibition in Hyde Park, London, Sprague conceived of a streetcar with a "self-adjusting, upward-pressure contact" (Rowsome, 1956). After applying for a patent three years later, Sprague went to work with Thomas Edison and later founded the Sprague Electric Railway and Motor Car Company. He revolutionized mass transit with the electrification of street railways by designing a system with highly efficient motors, flexible control and regenerative braking that he applied with the Richmond, Virginia, trolley system in 1888 (Rowsome, 1956).

Houston's late nineteenth century description of the fundamental principles of streetcar circuitry illustrates the infrastructure requirements that cities faced with the installation of the electric streetcar system during the accelerating period of streetcar growth. An electric circuit was generated in a power house, through a trolley wire and tracks, to the streetcar motor enabling a conductor on the streetcar to operate a switch that would open or close the circuit thus controlling the power source and movement of the car (Houston, 1896) (see Figure 2.1).

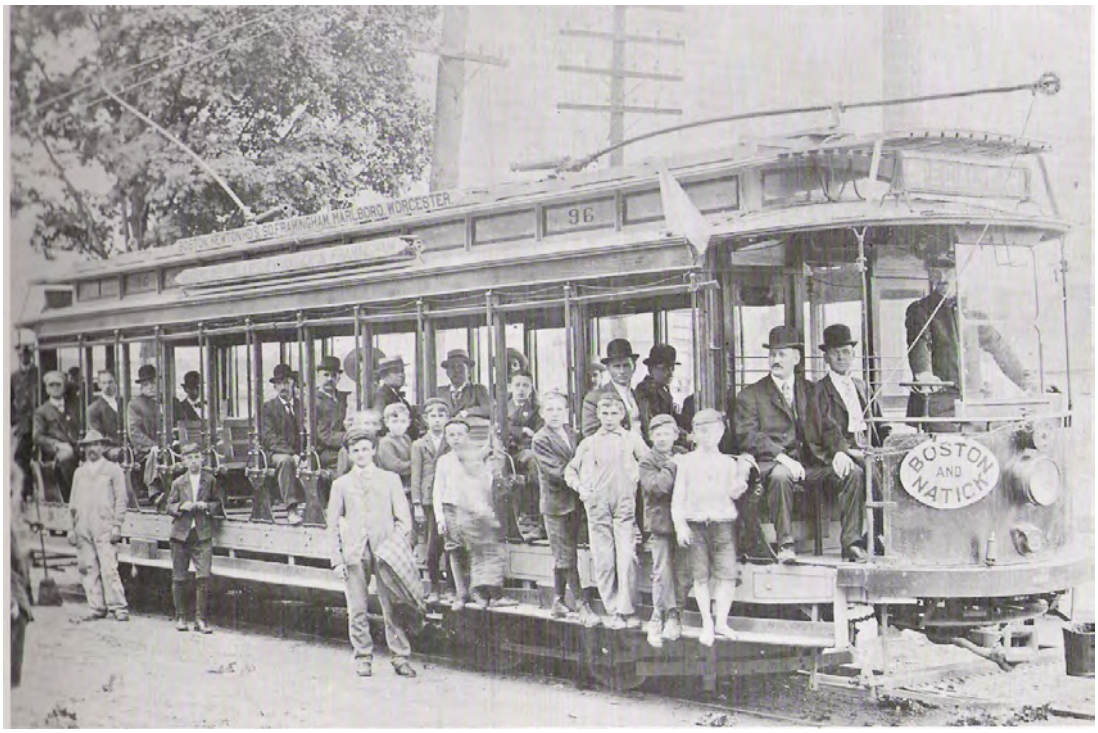


Figure 2.1. An Open, 70-Passenger Streetcar on the Boston & Worcester Street Railway. *Collection of LeRoy O. King* from *The Time of the Trolley* by William D. Middleton

Samuel Bass Warner provides a vivid description of changing urban trends during the late nineteenth and early twentieth centuries in *Streetcar Suburbs* based on the effects of streetcar service upon Boston. Boston's expanded streetcar system increased the distances of new construction approximately forty percent from the urban core to the outer suburbs from 1870 to 1890. Like Boston, many municipalities eagerly extended public services as their fees and taxes increased with the prosperity of the residents in the new inner ring suburbs and the higher property values (Warner, 1978).

Fogelson wrote an interpretative history that defined the changing character of the city with various metaphors of the time based on the urban growth patterns. He

compared the city to a wheel, whereas the business district was the hub, the major streets and streetcar lines represented the spokes, the borders of the city were the rim and the residential neighborhoods were adjacent to the spokes (Fogelson, 2001). Unfortunately, the hub of the wheel suffered the consequences of urban decay as the spokes and their adjacent residential neighborhoods expanded further and further out with middle and upper-class migration (see Figure 2.2).

The dramatic social and geographical changes that occurred in American cities during the early decades of the twentieth century led to profound economic and political

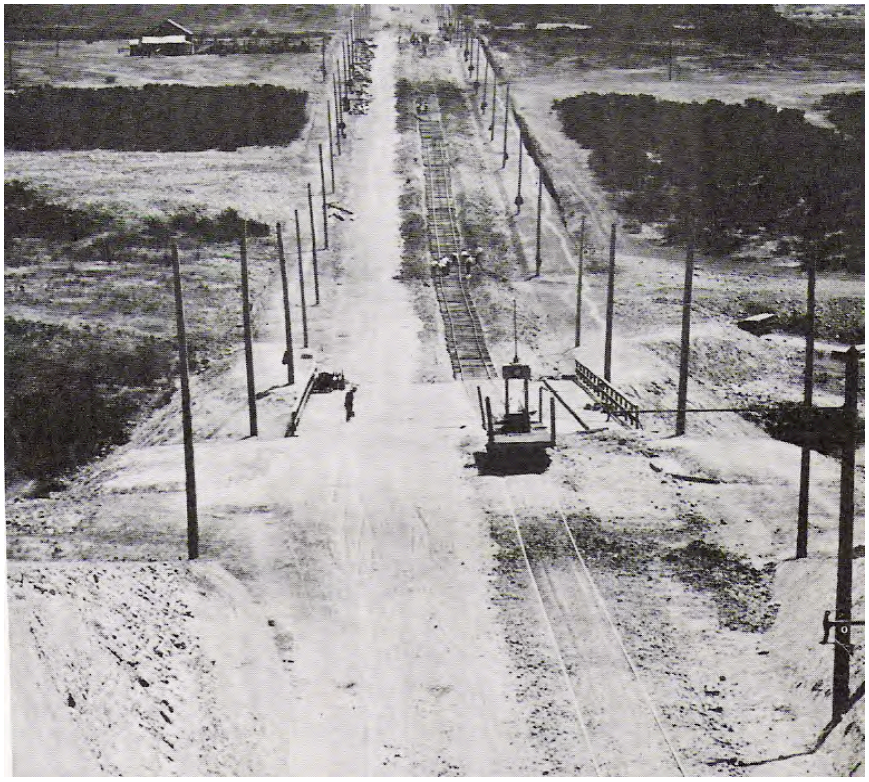


Figure 2.2. San Diego Electric Railway Extension of University Avenue Service with Accompanying Residential Development in 1907. *Historical Collection, Union Title Office, Title Insurance & Trust Company, San Diego*. Reprinted from *The Time of the Trolley* by William D. Middleton

ramifications. The technological advancements enabling streetcar service to evolve from horse-drawn streetcars to the dominant form of electrified streetcar transit created significant changes within the real estate industry. Many streetcar companies became actively involved as development entities or joint venture partners in real estate development firms. This development strategy was fueled by a motivation to primarily increase streetcar ridership. Streetcar system operators in effect created a business model that has been labeled "development oriented transit", a historic precedent to the contemporary models of transit-oriented development (Dittmar & Ohland, 2004).

The electric streetcars facilitated a dramatic change in demographics and according to the 1902 Census provided "an important social need" by distributing a burgeoning urban population into the new inner-ring suburbs that were being largely developed by the streetcar companies. The population growth followed the new streetcar lines line like spines radiating from the urban core. The linear growth patterns resulted in higher land values along the streetcar routes and the operation of the streetcar companies almost entirely dictated the scope of new development. Whereas the horsecar had pushed the distance for a residence to approximately four miles from the urban core, the electric streetcar greatly expanded the limits of urban growth thereby changing the character of the American city in dramatic fashion (Middleton, 1987).

Bernstein notes that some of the most effective urban planning was conducted by the streetcar companies with the acquisition of adjacent property that coincided with the extension of streetcar lines. Recognizing that additional development would support ridership of the streetcar, carefully-planned communities adjacent to streetcar lines

expanded cities in a manner that benefited the municipality with an increased tax base without the public infrastructure costs that are pervasive with highway expansion today (Bernstein, 2007).

The attributes of the early streetcar suburbs included a wide range of housing from small cottages to large estates in developments that were based on distinctive gridiron street patterns and designed around prominent civic areas that instilled a sense of community (Bernick & Cervero, 1997). The design of the streetcar suburbs were compact with a mixture of uses and medium densities that encouraged walking in addition to the streetcar for transit (Ellis, 2001). The popularity of the new streetcar suburbs resulted in a separation of the home and work for the first time and it has been estimated that as much as one-quarter of the U. S. population resided at one time in urban or suburban areas that were defined by the streetcar (Smerk, 1967; Bernick & Cervero, 1997.

The growth of the streetcar suburbs had social outcomes that caught the attention of sociologists. The Chicago school of sociology led by Park, Burgess and McKenzie first considered social life as subject to the available transportation systems of the residents within a particular community (Park, Burgess & Mckenzie, 1925).

Abbott's landmark book, *Urban America in the Modern Age,* offers a vivid account of the impact of the automobile upon streetcars. Streetcar ridership peaked in 1923 as automobile ownership by 1920 was still limited to one car for every thirteen Americans. By 1930, one in five Americans owned an automobile and the automobile

commute became a symbol of status thereby sentencing the fate of the electric streetcar (Abbott, 1987).

By the 1920s, suburbs had been developed in all but the smallest cities and towns. However, they were still dependent upon streetcar and interurban railroad lines. The increased popularity of the automobile would dramatically change the characteristics of the "streetcar suburbs" over next several decades. St. Clair writes how the automobile freed the suburbanite from public transit and of the changing patterns of suburban growth aided by a shift in governmental planning with an emphasis on the planning and construction of highways (St. Clair, 1986).

By the 1940s and 1950s, low gasoline prices and a post-war housing shortage encouraged extensive suburban development. Housing and commercial development in the suburbs was fueled by low property taxes, federal and state mortgage reform and the interstate highway system that resulted in homes being built further and further away from transit routes. The former star-shaped settlement patterns of American cities that had been shaped by the streetcar gave way to decentralized growth with scattered destinations accompanying the rapid growth of the suburbs (Bernick & Cervero, 1997).

Stanley Mallach's examination of the decline of the streetcar goes beyond the increased popularity of the automobile and he convincingly demonstrates that other factors acerbated the decline. He attributes the role of owner mismanagement and overbearing governmental regulations as contributing factors to the decline of the streetcar in *The Origins of the Decline of Urban Mass Transportation in the United States, 1890 – 1930* (1966). The exuberant use of long-term bond financing and the lack

of fare increases, due to governmental approval processes, burdened streetcar companies with heavy debt service obligations and marginal revenues at a time of peak ridership. It was a time when capital funds were urgently needed for expansion. Streetcar systems were also encumbered with labor problems and decrepit track conditions were often ignored from the mismanagement of many streetcar operators (Mallach, 1996).

Bernick and Cervero point out that streetcar companies were often forced by local authorities to extend service to sparsely populated areas with little regard to whether ridership could support the regulated low fares that were typically a nickel. Utility companies began acquiring streetcar systems in the 1910s and 1920s in an effort to monopolize electricity sales. To expand service, aggressive expansion policies treated streetcar operations as a loss leader to extend utility service. By the time antitrust rulings in the mid-1930s forced public utility companies to divest themselves of streetcar holdings, approximately 250 streetcar operators had folded (Bernick & Cervero, 1997).

The Depression and subsequent antitrust policies of the New Deal further weakened many of the streetcar companies that were under the financial strain of marginal profitability. Enforcement of new antitrust legislation prohibited the access of many of the financial ventures of streetcar companies with electric utilities to much-needed capital for upgrading service (Jones, 2008).

During this same era, National City Lines was founded under the General Motors bus subsidiary Yellow Truck and Coach. National City Lines embarked upon an acquisition strategy, beginning with the Los Angeles Railway, to acquire streetcar companies in a number of markets and replace the streetcars with motor buses. By 1947,

conspiracy and antitrust charges were filed by the United States Justice Department against National City Lines, General Motors and other partners including Standard Oil of California, Firestone Tire, Mack Truck and Phillips Petroleum. The jury's verdict did rule that the defendants (except Mack Truck) were guilty of a "conspiracy to monopolize" the bus business (by requiring only Yellow Coach buses be purchased by NCL) but the defendants were acquitted of other conspiracy and antitrust charges (Ladd, 2008).

David St. Clair's account of the alleged "conversion for destruction" conspiracy theory determined there "is no smoking gun" but the willful motorization campaign to destroy electric public transit left a pattern of activities that were "highly suspect". He also acknowledges other contributing factors such as the financial distress of streetcar franchise owners due to the increased fees and regulations imposed by local municipalities (St. Clair, 1986).

The conspiracy claims against General Motors and National City Lines fueled an intense and complicated debate that should not be reduced to a simplistic interpretation of the court's ruling as the demise of street railway systems. However, the vested interest of government agencies and certain corporations following World War II points to a public policy campaign vested in the "proliferation of automobiles" and the promotion of highway construction to best serve public interest (Ellis, 2001, p. 258).

An opportunity was lost in the late 1940s when the tentative routes for the Interstate Highway System were proposed. Some city planners encouraged a proper role for mass transit with freeways and numerous proposals to integrate rail and bus transit

with urban interstate systems were tendered (Ellis, 2001). Although the feasibility of routing some rail lines down freeway medians was acknowledged, "streetcars and trolley coaches were not compatible with the new urban freeways" (St. Clair, 1986; Ellis, 2001).

Attention was increasingly focused on funding highway improvements and public transit became a low priority within most municipalities. Streetcar routes were dismantled and service discontinued leaving inferior bus systems that were largely shunned by all but demographic classes that were not able to enjoy the new culture of the automobile.

Re-emergence of the Streetcar and Transit-Oriented Development

Following decades of activity largely limited to tourism-related usage, streetcars have made a remarkable comeback in dozens of cities. This coincides with the emergence of a new generation of transit-oriented development as compared to the "development oriented transit" models of the historic trolley era. The role of heritage streetcars as a revitalization strategy was first noted by Kevin Lynch (1981) with his widely-read book on a new paradigm for urban planning practices, *A Theory of Good City Form*. Lynch attributed the increased popularity of streetcars to their character-defining features with "unique symbols and cultural overlay" that helped "create vivid memories and give one an understanding of a place."

Bernick and Cervero also emphasize the ability to look to the past with streetcars by stating that although the emergence of transit-oriented development in recent decades has been portrayed as a recent phenomenon, there is a historical precedent with the development of streetcar suburbs during the late nineteenth and early twentieth centuries.

As planners consider and build the transit villages of tomorrow, they should look to the past as there are historic lessons to be learned from the streetcar developments of yesterday. The streetcar suburbs of Shaker Heights, Pasadena and the East Bay of California serve as exemplars of planned, residential communities around streetcar lines. Residential enclaves were built adjacent to vibrant commercial centers that sprung up around transit stops. In the case of Shaker Heights, broad boulevards with wide medians for the streetcar tracks provided for a residential setting that featured large estates and picturesque neighborhoods. The popularity of Shaker Heights led to the adoption of a comprehensive plan that carefully specified street layouts, design standards and zoning controls (Bernick & Cervero, 1997).

Warner writes of the physical characteristics of streetcar suburbs that offered a new lifestyle that seemed beyond reach to everyone except the most privileged just a few decades earlier. Middle-class residents of the new suburbs enjoyed a substantial increase in the size of their lots by leaving row-house lots of the inner-city for suburban lots ranging from 4,000 to 6,000 square feet. As land was inexpensive, streetcar systems pursued level tracts of farmland to maintain gradual grades and to make the tracks accessible for passengers. Site plans of the streetcar suburbs predominantly relied on the historic street grid patterns of the eighteenth and nineteenth centuries. As farm land was acquired for development, utility companies would typically install water and sewer mains down existing country roads. This followed the practice of the streetcar companies to utilize established roads for new tracks. The land was subsequently subdivided and developed along new roads built at right angles to the existing roads. The result was a

rectangular land plan with street grids and narrow frontage lots. This enabled builders to minimize the street surface area and reduce infrastructure costs. The integration of rear alleys also allowed builders to conserve land area and provide an alternate means of access (Warner, 1978).

In addition to utility improvements, cities built schools, fire stations and libraries within streetcar suburbs. As the land was often conveyed to the cities without charge or at below-market prices, assisting private development was a common practice. Although this policy came at the expense of urban core projects, the rationale of an increased tax base justified significant expenditures in the suburbs. The better planned streetcar suburbs were oriented around school, church and library sites creating focal points for the neighborhood. A sense of community soon emerged with a new suburban form that decreased the need to go downtown for education or worship thus contributing to the start of a gradual, urban decline.

Noted architect Robert A. M. Stern singled out railroad and streetcar suburbs as models in a 1979 exhibit on "America's suburbs" sponsored by the Smithsonian Institution's National Museum of Design. He acclaimed their "compact, walkable design that facilitated social interaction as well as their architectural charm and integrity. The suburb represents a state of mind based on imagery and symbolism." (Stern, 1981; Bernick & Cervero, 1997).

Wilson's chronology of the reintroduction of streetcars reveals that systems implemented during the 1980s were largely enthusiast inspired or linked to museum or tourist attractions. The Memphis urban circulator system in 1993 opened a new chapter

with streetcars whereas they began operating in mixed traffic and other cities such as Portland, Tampa, Little Rock and Tacoma soon followed suit. Approximately twenty-five cities have commenced streetcar service since the mid-1970s and numerous other cities are conducting due diligence regarding the feasibility of service (Wilson, 2006).

The construction of fixed-guideway systems, as utilized by streetcars, require a significantly higher capital investment but Vuchic noted that a transition from steered, bus systems to fixed-rail systems attracts a significantly greater number of passengers (Vuchic, 2004). A study that appeared to reinforce Vuchic's claim was a survey conducted with streetcar riders on Dallas' McKinney Avenue system. Findings of the survey show that more than 90% of the riders had never before used city transit of any type (Wilson, 2006). This study offered a glimpse into streetcar usage as an amenity and seemed to indicate a connection between the attractiveness of streetcars as a new and more desirable transit option to residents of streetcar-oriented developments.

The impact of changing demographics has also contributed to a dramatic transformation of the urban landscape with increased attention within the planning literature. The U. S. population surpassed 300 million in 2006 and is expected to grow by an additional 120 million people by 2050. Much of this growth is from immigration, a higher percentage of users of public transit. Currently more than twelve percent (35 million) of our population was born outside of the country and approximately 90% of these foreign-born residents live in the top 100 metropolitan areas (Puentes, 2008). Catherine Ross and Anne Dunning provided an analysis of the 1995 National Personal Transportation Survey that revealed immigrants and minorities were more likely to use

mass transit than the overall population would use it (Dittmar & Ohland, 2004; Ross & Dunning, 1997). Similarly, the emergence of "non-families" (households comprised of one individual or non-relatives) will also constitute a significant market influence upon urban areas and transit-oriented development. Since 1980, this demographic category had the largest percentage increase and is increasingly motivated to live near urban amenities (Puentes, 2008). An important characteristic of this demographic category has been the influence of the "creative class" and related priorities placed on distinctive urban environments. The pent-up demand for TOD and walkable urbanism was first obvious in the rental apartment market with the Generation X and Y demographics which comprise much of the creative class (Leinberger, 2008).

The reintroduction of heritage streetcars provides a character-defining amenity for their urban lifestyle. In walkable urban environments, people are attracted to street activities, encouraging retail and restaurant activity and ultimately creating higher property values (Leinberger, 2008). Increased densities and diverse uses within walking distance of heritage streetcar lines create a lively urban atmosphere consistent with transit-oriented development. The character of a walkable urban place complements the circular mode of heritage streetcars with a variety of uses within a few hundred feet on different blocks (Leinberger, 2008). It is projected that more than $30 trillion will be spent on real estate development between 2000 and 2025 including nearly 34 million new homes (Nelson, 2006; Leinberger, 2008). Much of the pent-up demand will be for walkable, high-density urban units such as in transit-oriented development and by 2025,

transit-oriented housing will be preferred by 25% of those seeking new households (Dorn, 2004).

Theoretical Underpinning for Land Use and Transportation Accessibility

Accessibility to transportation has shaped urban residential patterns and provided the underpinning for many theoretical statements. Hurd's early theory of land rent was predicated upon land values reflecting the degree of accessibility to the urban center, presumably with improved access to transportation systems (Hurd, 1924). A theory of the same era by Haig refined the relationship of accessibility and land values by hypothesizing that land values were significantly influenced by the savings realized with reduced transportation costs (Haig, 1926). Sites with lower transportation costs reduce the cost of time and money over alternative sites and increase the desirability of central locations for new housing (Frieden, 1964).

Alonso's location theory is based on a consumer's residential choice between lower commuting costs and more expensive housing as compared to cheaper housing but increasing commuting time and higher transportation costs (Alonso, 1960). As one moves further away from the urban center, the commuting costs are evaluated in terms of time and money. The individual develops a series of "bid rent curves" that correspond to levels of satisfaction and the consumer will select a location that provides the highest level of satisfaction (Frieden, 1964).

A theoretical model developed by Lowdon Wingo, Jr. takes into account the technology of the transportation system and the individual's valuation of lost leisure time resulting from travel time to work. Similar to Hurd's and Alonso's theories, the consumer

weighs the advantages of a central location and the increased leisure time against higher land rents associated with accessibility to transportation reduced commuting time (Wingo, 1961).

A contemporary pattern of urban residential housing is consistent with the aforementioned theories. The increased costs resulting from higher fuel costs and traffic delays from congestion have become the driving force for an increased demand for transit-oriented development and will figure prominently in the continued evolution of infill development associated with different forms of public transit such as heritage streetcars.

Evolution of Transit-Oriented Development

The growing acceptance of transit-oriented development in recent decades has coincided with the increased popularity of reintroduced streetcars. A useful account of the evolution of transit-oriented development from the early "park-and-ride" or "kiss-and-ride" developments that were synonymous with MARTA (Metropolitan Atlanta Rapid Transit Authority) or the METRO in Washington, D. C. is portrayed in Dittmar and Ohland's *New Transit Towns* (2004). The authors note that transit-oriented development has evolved from asphalt-dominated MARTA and METRO developments with minimal consideration to connectivity and pedestrianism to neighborhood-friendly, mixed-use developments that are focused on reduced automobile dependency and walkability. Like the early streetcar operators, many transit systems of the twenty-first century also take an active role with real estate development with joint ventures to capture value created by the transit system. To effectively capture the value associated

with transit-oriented development, planners should strive to achieve an appropriate mix of uses, provide locational efficiency, have various densities, allow for place making and resolution of tension that may arise from the transit stop as a node and its role as a place (Dittmar & Ohland, 2004). Farr (2008) writes of the mutual goals of sustainable urbanism and transit access whereas sustainable urbanist developments "…need to be located in existing or proposed transit corridors and with a sufficient properly-distributed density to support a robust level of bus, bus rapid transit, streetcar, trolley, or light rail service."

The relationship of urban location theory with the evolution of transit-oriented development is explored in Cervero's *The Transit Metropolis*. Citing the influences of transit upon urban form, the mode of transit should offer locational advantages with reduced travel time and costs thereby increasing developer's competition for sites and driving up land values (Cervero, 1998). As offices and other commercial uses have increasingly located near transit stations, residential developments have typically followed being attracted by the co-mingled retail uses and reduced commuting time.

Frank's (1999) case study of the City of Atlanta's redevelopment strategy around Lindbergh Station provides a thorough analysis of MARTA's efforts to place a higher priority on "livable community" considerations, a dramatic departure from the early generation of parking lot dominated MARTA transit stations. By establishing a livable community goal that had equal footing with increased transit ridership and economic development, the City of Atlanta encouraged connectivity and a walkable environment throughout the station area (Frank, Stephenson Smith & Matthews, 1999).

An ultimate objective of transit-oriented developments that has received increased attention in the literature is to recapture the positive features of "yesteryear's cityscapes—comfortable and enjoyable streetscapes, vibrant and interactive public spaces, and an assemblage of land uses that invite people to stroll, linger, and interact with each other." (Transportation Research Board, 2004). Costello, Mendelsohn, Canby and Bender stated that the literature on transit-oriented development shifted the focus on urban design to an approach that borrowed heavily from the past with "time-honored strategies" (2003).

Cervero and Duncan (2001) have identified four major trends that have enabled transit-oriented development to better respond to the changing needs of urban planning models. The first trend has been a more receptive public policy regarding the integration of transportation and land use planning initiated with legislation such as the Intermodal Surface Transportation Act of 1991 and the Transportation Equity Act for the Twenty First Century (TEA-21). Funding by the Federal Transit Administration has been increasingly directed to local governments for interpreting transit-supportive polices with appropriate land-use planning. Changing demographics have driven the second trend with more "empty nesters", younger adults and childless couples, seeking a more urban lifestyle with smaller homes. The third trend is the result of increased traffic congestion and higher fuel costs motivating many people to live close to transit in an effort to reduce transportation costs and commuting time. The fourth major trend has been the relocation of many corporations closer to transit (Cervero & Duncan, 2001).

Cervero and Duncan's third trend deserves additional scrutiny as it has become an increasingly important consideration within the past several years due to recent spikes in oil prices and unprecedented traffic congestion. An empirical study by John Holtzclaw helped substantiate the hypothesis that residents of transit-oriented developments have significantly lower automobile mileage. His San Francisco Bay Area survey revealed that transit-oriented neighborhoods had approximately half (15,700 annual miles) vehicle miles as surveyed residents in new, non-TOD suburbs (31,300 annual miles) (Calthorpe, 1993). If one were to apply the 2008 IRS allowable mileage deduction of .415, this would equate to an annual savings of $6,474.

Bernick and Cevervo placed the social costs of highway congestion at roughly two percent of the U. S. Gross Domestic Product based on Rowland's 1989 study for *Automotive News* (1997). More recently, the Texas Transportation Institute placed the 2001 annual cost of congestion per capita for 75 large U. S. metropolitan areas at $520 based on 26 hours of delay and 42 gallons of extra fuel. On a national scale, this equated to a total cost of nearly $70 billion (Schrank & Lomax, 2003—Urban Mobility Report).

The concerns over externalities from traffic congestion and limited energy resources dramatically influenced public transit ridership during 2007 and 2008. Sharply higher gasoline prices were a major contributor to the highest number of trips taken on public transit in fifty years. In 2007, there were approximately 10.3 billion public transit trips and in 2008, public transit ridership increased an additional four percent to 10.7 billion trips (Johnson, 2008; Bello, 2009). It is noteworthy that "streetcars and trolleys had the highest percentage increase (10.3%) in transit ridership in 2007 (Johnson, 2008).

Higher gasoline prices in recent years had a profound effect on Americans' attitudes toward mass transit. In the first six months of 2008, motorists drove approximately 30 billion fewer miles than the same period in 2007. At current gasoline prices, the average family would spend roughly $6,200 in gasoline for two cars (Pugh, 2008). The economics of such costs weigh heavily on most households and public transit becomes a beneficiary.

Downs writes of the effects caused by increased commuting time and mounting delays caused by traffic congestion. The average time Americans spent commuting each day has risen from 18.3 minutes in 1983 to 25.5 minutes in 2000, an increase of 40.1 percent. Downs notes that increased congestion also results in additional housing options as commuters focus on alternate housing locations which have favorable implications for transit-oriented development (Downs, 2004).

The benefits of public transit have received increased attention in planning literature as a result of a heightened concerned over climate change and sprawl. As ninety-eight percent of transportation fuel is petroleum-based and nearly all automobiles emit CO_2, there is growing concern over the effects of climate change (Puentes, 2008). Accordingly, more individuals have desired to reduce their carbon footprints thereby increasing the demand for transit-oriented residences and reduce automobile dependency. Empirical studies support the hypothesis that residents of transit-oriented developments have significantly lower automobile mileage. A San Francisco Bay Area survey revealed that transit-oriented neighborhoods had approximately half (15,700 annual miles) vehicle miles as surveyed residents in new, non-TOD suburbs (31,300 annual miles) (Calthorpe,

1993). If one were to apply the 2008 IRS allowable mileage deduction of .415, this would equate to an annual savings of $6,474.

Smart growth initiatives with organizations such as Smart Growth America and anti-sprawl groups such as the Sierra Club and the Lincoln Institute of Land Policy have extended consideration of public transit as another trend enabling transit-oriented development to better respond to changing social and economic forces. There is extensive literature on the culture of sprawl and Delores Hayden notes there is an increased emphasis by communities upon human priorities and public places that nurture social interaction rather than "automobile-oriented real estate" (Hayden, 2004).

With the evolution of transit-oriented development, the basic parameters of transit-oriented development have changed in the literature. One of the better attuned descriptions is from Bernick and Cervero's *Transit Villages of the 21st Century* whereas the authors advocate "a compact, mixed-use community, centered on a transit station that, by design, invites residents, workers, and shoppers to drive their cars less and ride mass transit more. The transit village extends roughly a quarter mile from a transit station, a distance that can be covered in about 5 minutes by foot, consistent with Calthorpe's position on creating walkable transit-oriented development. The centerpiece of the transit village is the transit station itself and the civic and public spaces that surround it. The transit station is what connects village residents to the rest of the region…" (Bernick & Cervero, 1997).

Calthorpe's seminal book on transit-oriented development, *The Next American Metropolis*, places a priority upon the walkability of the development and non-

automobile forms of mobility that encourage pedestrians to patronize the mixed-uses and public spaces. Accessibility is not only advantageous to transit-oriented development; it is an essential component that will dictate market success for adjoining residential and retail uses. By advocating carefully planned transit-oriented developments, Calthorpe encourages the placement of the transit station within the middle commercial, mixed-use and residential neighborhoods that will increase ridership and be treated as focal points for the community (Calthorpe, 1993).

It is also essential to view transit-oriented development on a larger scale that is regionally linked with co-dependent transit centers and served by high-capacity fixed-guideway transit service. Today, transit-oriented developments have drawn inspiration from the European models. In Europe, transit villages serve as community hubs with an intermodalism that provides a seamless connectivity based on travel efficiencies including walking, biking, buses and cars that generate ridership for the transit system (Cervero, Ferrell & Murphy, 2002).

The extensive rebirth of walkable, urban places and transit-oriented development compliments the reintroduction of heritage streetcars. Leinberger writes of a how most urban cores benefit from an existing urban design with compact city blocks and the attraction of street activities that encourage retail and restaurant activity which ultimately create higher property values (2008). The character of a walkable urban place complements the circular mode of heritage streetcars with a variety of uses within a few hundred feet on different blocks (Leinberger, 2008). Heritage streetcars in effect extend

neighborhoods by accelerating infill development and the adaptive use of existing structures.

However, it has been widely perceived by developers that infill, transit-oriented development entails higher risks than suburban development. While smart growth advocates have encouraged infill development, the related barriers associated with the higher costs with land assemblage, complex title issues, more rigorous regulatory policies associated with urban historic districts and an unwillingness of cities to use eminent domain make infill development a challenging process (Farris, 2001). The process of creating transit-oriented developments in infill locations is an incremental process and Fulton writes of how measureable goals are obtainable as long as smart growth advocates resist "mythologizing about the potential for urban development" and how they should think realistically of modest goals in urban settings (2001).

As transit-oriented development as evolved so has the view within the literature to include related social effects with the physical realm. The Transportation Research Board noted in their 2004 report on the "experiences, challenges, and prospects" of transit-oriented development in the United States that although the goal is to create settings that will let people drive less and ride public transit more, another significant benefit is to build social capital by strengthening the relationship between people and their community (Transportation Research Board, 2004).

Impact of Transit on Property Values

The theoretical underpinning for the locational advantages of transit access can be traced back to early land rent theories. Economists first considered land rents in the 18th

century with the Physiocrats' interest in agricultural land and rent was equated with production. J.H. von Thünen's theory of location differential rent (1826) viewed land rent as a function of the value of the agricultural production minus production costs and transport costs. In other words, shipping costs were factored into the economic model and offset revenues to determine the rent function (von Thünen, 1826).

Likewise, Ricardo's (1817) treatment of agricultural rent also recognized that land closer to the market bears lower transport costs and this advantage accrues to the landlord in the form of rent as a result of competition among farmers (Ricardo, 1817).

Hurd's early theory of land rent (1924) resembled von Thünen's theory of agricultural land theory. Hurd stated: "As value depends on economic rent, and rent on location, and location on convenience, and convenience on nearness, we may eliminate the intermediate steps and say value depends on nearness." His theory was predicated upon land values reflecting the degree of accessibility to the urban center, presumably with improved access to transportation systems. However, his consideration of the value of residential land was perplexing and he argued that "the basis of residence values is social and not economic—even though the land goes to the highest bidder." Hurd did account for the difference in the desirability of property locations being predicated upon the social service that the property renders. "The land that is most convenient is first utilized, and that which is less convenient is made of service in accordance with its diminishing facilities. Thus the value of all urban land ranges from that which least serves the smallest number of people of the lowest economic quality, up to that which best serves the largest number of people of the highest economic quality." Value

depends on economic rent, and rent on location, and location on convenience and convenience on nearness (Hurd, 1924).

By the 1920s, urban land theory was becoming more refined and Haig (1926) strongly emphasized the importance of transportation costs upon rent. He viewed the complimentary nature of accessibility and land values by hypothesizing that land values were significantly influenced by the savings realized with reduced transportation costs. He stated that transportation is a device to overcome the "friction of space" and the better the transportation, the less the friction. Haig also noted the layout and patterns of land use for a community would be a function of transportation costs and the degree of "friction" encountered. Haig's view of residential land is significant as he noted that transportation and accessibility are important considerations on the same scale as household commodities. He stated "In choosing a residence purely as a consumption proposition one buys accessibility precisely as one buys clothes or food. He considers how much he wants the contacts furnished by the central location, weighting the 'costs of friction' involved—the various possible combinations of site rent, time value, and transport costs: he compares this want with his other desires and his resources, and he fits into his scale of consumption and buys." (Haig, 1926).

The Ecological Theory of the Chicago School led by Park and Burgess had a parallel theory of urban land economics that viewed land values as the predominant factor in the segregation of local areas and the determination of uses. Park acknowledged that improvements in transportation and the accompanying population growth increased the locational advantages of the urban core (Park, 1925).

Wingo placed a value of commuting costs in dollars and resembles the earlier theories of complimentary rent and transport costs. He states that the sum of rents and transport costs comprise a constant equal with transport costs to the most distant residential location increasing while transport costs to the most convenient residential locations decreasing forming a state of equilibrium subject to the supply of land (Wingo, 1961).

Alonso's Theory of Location and Land Use broadened the scope of location preferences for the individual household maximizing its level of satisfaction based on consumer preferences, transportation costs of the household, prices of land, and quantities of space required. Alonso's location theory is based on a consumer's residential choice between lower commuting costs and more expensive housing as compared to cheaper housing but increasing commuting time and higher transportation costs. He used bid price curves as a means of the individual resident finding an individual equilibrium derived from the set of land prices the individual could pay at various distances while maintaining a constant level of satisfaction. Alonso's "bid rent function" is the set of amounts that a household would bid for land at alternative locations in order to obtain a certain level of utility. How much households bid depend upon the extent of the competition from other bidders. It is important to note that each individual has an infinite number of levels of satisfaction while bid price curves are shaped differently for different individuals. Relying on a "locus of opportunities", the individual considers the price of the land, his income, his costs of commuting, and the price of the composite good. A bid

price curve is comprised of the various combinations of land prices and commuting distances among which the individual is indifferent (Alonso, 1964).

Muth and Mills' Residential Location Theory (Mills, 1967 and Muth, 1969) introduced "housing" as a commodity rather than land whereas housing is produced with land and households help create a demand for land. Similar to the Alonso model with consideration to travel costs depending on distance and value of time, Muth also examined the relationship of housing and employment arguing that housing and employment accessibility are jointly purchased.

These strands of theory lend support to contemporary paradigms regarding transit access, land use and value implications. In recent years there has been considerable literature devoted to hedonic price modeling with correlational research regarding the impact of light rail transit use and property values. Sherry Ryan (1999) evaluated the literature on the relationship of property values and accessibility to all modes of transportation facilities (highways, heavy rail and light rail). This evaluation revealed a lack of consistent relationships between highways and heavy rail transit and increased property values. More significantly, Ryan concluded that a majority of the studies indicated a positive correlation between access to light rail and property values (Ryan, 1999).

Similar findings were uncovered with studies conducted in San Diego, San Francisco, Miami and Philadelphia. A study of property values and transit-oriented development in San Diego found that apartment occupancy levels were 5% higher and retail centers had increased values of $25 per square foot when located in close proximity

to the San Diego light rail system (Huang, 1996). Another comparison of apartment rents within walking distance of the East Bay Bart stations indicated 10-15% rent premiums over comparable apartment projects (Bernick & Cervero, 1997). In Alameda and Contra Costa Counties, California for every meter a home is closer to BART, the sale price of homes increased $1.96 to $2.29 (Landis, Guhathakurta, Huang & Zhang 1994). Likewise a study of residential property values near the Lidenwold, New Jersey rail line (Philadelphia metro) had an average value premium of 6.4% (Voith, 1993). Although the majority of studies examining the correlation of increased property values and light rail transit use indicated a positive correlation, a study of single-family residences near the Miami Metrorail system revealed a weak relationship, which is contrary to the majority of similar studies in other cities (Gatzlaff & Smith, 1993).

Framework for Social Interaction Among Residents in Streetcar-Oriented Developments

Streetcars are known for distinctive characteristics that encourage social behaviors typically not found with other modes of transportation. Middleton noted the social advantages of the early streetcars including their popularity as a means of courtship. The Yakima (Washington) newspaper reported that "marriages based on streetcar courtships seemed to stick" (Middleton, 1987). Streetcar operators quickly noted that streetcars became more than a utilitarian means of travel to work. The social benefits of pleasure travel ranged from boarding the streetcars for the sheer pleasure of trolley riding to family picnics, church and other social outings such as trips to nearby park or resort. Health benefits were also associated with streetcars including a Louisville

physician's recommendation that streetcars provided the best cure for insomnia with the claim that "an hour's streetcar riding scarcely ever fails to bring on a feeling of drowsiness, and it has actually been able to bring sleep to the most nerve-racked of insomniacs by this simple device." (Middleton, 1987).

The literature that is specific to the social behavior among residents of transit-oriented developments today is somewhat limited and deserves further scholarly research. Podobnik's (2002) research of the social achievements related to transit-oriented development at Orenco Station in Portland, OR, revealed evidence of increased social interaction among residents. Within the context of this literature review, an operational definition of s*ocial interaction* shall consist of formal and informal social opportunities in which a resident encounters at least one other resident and interacts in a manner that "attends to the quality of their relationship" (Kim & Kaplan, 2004) (see Figure 2.3). The interactions shall be classified as informal, formal and community participation activities. Informal interactions shall be considered to be chance or unplanned encounters resulting such as seeing a neighbor at the streetcar stop and exchanging pleasantries. Formal social interactions are considered to be pre-arranged activities such as simply meeting for coffee or more structured engagements like neighborhood association meetings. Community participation shall include attending neighborhood association meetings, regular church attendance or active membership in an organization such as the local school's PTA. The interaction shall be examined with a) propinquity behaviors—social cohesion or

Figure 2.3. River Rail Streetcar in Little Rock. Photograph courtesy of Central Arkansas Transit System

affiliation between residents within the same development or same block (Podobnik, 2002; Kim & Kaplan, 2004; Buckner, 1988; Glynn, 1986; Festinger, Schachter, & Black, 1950); b) the relationship of the physical design of streetcar-oriented developments and the heritage streetcars that affect the opportunities for social interaction (Alexander, Ishikawa & Silverstein, 1977; Lund, 2003; Dunphy, Cervero, Dock, McAvey, Porter, & Swenson 2004).

Lund's (2006) research regarding the reasons for living in transit-oriented developments in the San Francisco Bay Area, Los Angeles and San Diego area provides some insight into the motivation of residents relocating to transit-oriented developments. Her research indicates that people live in transit-oriented developments for a wide variety of reasons ranging from cost considerations of housing, travel behavior, access to shops

and services and quality of the neighborhood. Lund's findings revealed that transit access was an important consideration only in the San Francisco Bay Area as compared to San Diego and Los Angeles. Greater or equal importance was placed upon the type or quality of housing, cost of housing and the quality of the neighborhood in all three California markets. One aspect of the study that was not surprising was transit-oriented residents were 13 to 40 times more likely to use the available transit system than residents in non-transit areas (Lund, 2006).

To gain a broader perspective, there is a parallel with research into the social behavior of residents in new urbanist communities. These communities possess similar characteristics (walkability, active street life, etc.) as successful transit-oriented developments. Podobnik's *New Urbanism and the Generation of Social Capital: Evidence from Orenco Station* is the result of a research study that focused on the social dynamics of the residents of a new urbanist and transit-oriented community (Orenco Station) as compared to the residents of two other Portland neighborhoods. The two other communities exhibited similar physical characteristics but were not new urbanist communities. Podobnik's research addresses the issue of propinquity in new urbanist communities with an in-depth survey of social cohesion among the residents. His research is noteworthy given the widely-claimed assertion that new urbanist communities do foster more socially enriching lifestyles. His findings indicated a significantly higher level of social cohesiveness for the new urbanist Orenco Station (Podobnik, 2002). Within the context of this study, a model of social interaction is shown in Figure 2.4.

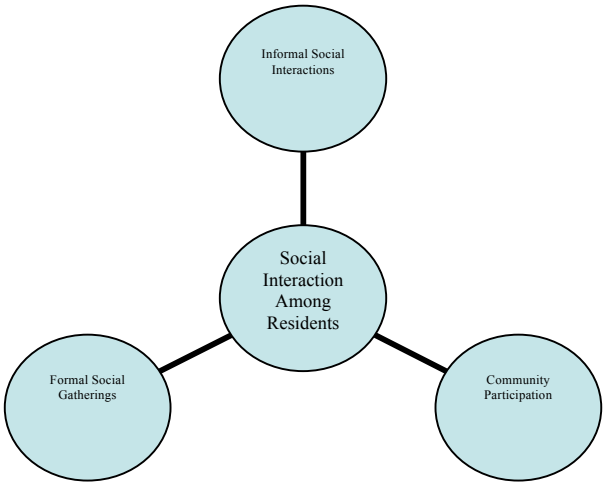


Figure 2.4. Model for Social Interaction Among Residents in Streetcar-Oriented Developments.

Framework for Community Identity with Streetcars and Streetcar-Oriented Developments

The physical characteristics of heritage streetcars and streetcar-oriented developments have a sense of character that fosters unique dimensions of identity. The conceptual framework for *community identity* is derived from a wide range of knowledge within the literature. Joongsub Kim's research of new urbanist Kentlands and a nearby, conventional neighborhood named Orchard Village provides an operational definition of *community identity* that is applicable for this dissertation by describing it as "personal and public identification with a specific geographic community that has its own character" (Kim, 2001). Expanding the scope of this research under this definition, the link between heritage streetcars and community identity is engendered by a) a tangible link between the past and present (Alexander et al., 1977; Lynch, 1981; Mumford, 1961; Kim &

Kaplan, 2004); b) distinctiveness (Kim & Kaplan, 2004; Twigger-Ross & Uzzell, 1996); and c) sense of attachment—"happy to belong", an implied feeling of community (Rothenbuhler, Mullen, DeLaurell & Ryu, 1996; Kim & Kaplan, 2004). Within the context of this study, a model of community identity is shown in Figure 2.5.

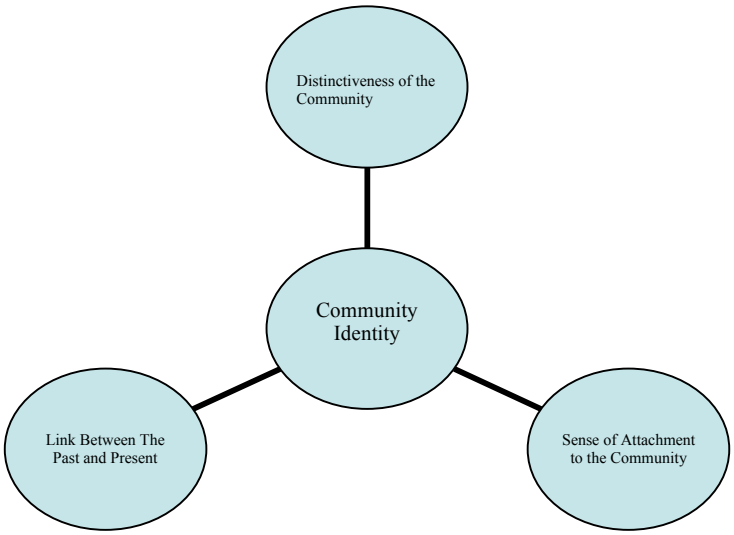


Figure 2.5. Model for Community Identity.

Community Identity Engendered by ATangible Link between the Past and Present

Heritage streetcars represent a symbolic attachment with a community's past. Transit-oriented development accompanying the reintroduction of streetcars should also draw from the historic precedent of the streetcar suburbs to fully define the character and create a place of attachment.

The strand of literature in this field draws its theoretical underpinning from attachment theory that has been used primarily to examine an individual's previous social, emotional, cognitive, and behavioral experiences as viewed later in life (Hashas, 2004). It is an individual's experiences that are organized and classified to create expectations to develop feelings of security and comfort associated with attachment to objects or places (Marris, 1996; Hashas, 2004).

David Lowenthal writes of a "finite and dwindling commodity" with our identity to tangible remains of the past (1985). He acknowledges that our rapid pace of life today is an unsettling routine for many individuals leaving them with a sense of disconnect. The ability to reconnect and interact with the past has become an important consideration to regain a sense of stability and identity. Heritage streetcars play an important role fostering a unique sense of community identity associated with an ability to connect with tangible characteristics of the past (Lowenthal, 1985).

Distinctiveness and Community Identity

Relph expresses the importance of "place" based on the meaningful experiences and our involvement with places of personal significance. Describing "place" as a "multi-faceted phenomenon of experience", he stresses the importance of a community having an identity with places that provide for meaningful experiences through personal involvement. Otherwise, a community suffers from "placelessness" resulting from a weakening of distinct and diverse experiences (Relph, 1976).

Similar to the concept of *community identity,* Relph interprets *place identity* to be derived from the physical environment, activities, and meanings that allow an individual

to distinguish an environment from other places and "serves as the basis for its recognition as a separate entity. The meanings of place identity are embedded in an individual's physical environment, objects or activities as formed by cognition through memories, values and experiences (Hashas, 2004).

Fried's research also explored *place identity* and feelings of sadness and depression resulting among relocated residents of Boston's West End following urban renewal projects of the 1950s and 1960s (Fried, 1963; Hashas, 2004). Fried writes of this phenomenon based on "spatial memories, spatial imagery, the spatial framework of current activity" that affect an individual's perceptions of his attachment of place within the environment (Fried, 1963).

Neighborhood design theory draws heavily from social goals of planners that have strived to create a sense of community identity. The importance of social interaction and social control has been stressed in order to achieve neighborhood stability since the 1920s with the writings of Park, Burgess and Mackenzie and the planning principles of Clarence Perry and Clarence Stein (Talen, 2000). The idea of place attachment as it relates to the preferences of community residents has generated provocative research with environmental behaviorists.

Community Identity and Sense of Attachment

The relationship of community attachment within the context of community involvement and communication was explored by Rothenbuhler, Mullen, DeLaurell and Ryu with a premise that community attachment enables one to feel "happy and proud to belong" creating an implied feeling they are part of a community. Accordingly, a

resident that is socially involved within the community will be engaged in local issues and interacts with other residents on community problems (Rothenbuhler et al., 1996).

Dunphy emphasizes that "place making" should be a design approach that involves a holistic view involving the composition of the streets, an appropriate mix of uses, a pedestrian orientation and open spaces that individuals enjoying using (2004). As an old idea that has been resurrected, transit-oriented development can create distinctive places that complement the character of heritage streetcars and foster a distinct sense of community attachment.

The reintroduction of heritage streetcar service enhances a community's identity or sense of place while providing a meaningful experience through personal involvement (as expressed by Relph) with a historic mode of travel. Furthermore, distinct aspects of the streetcar environment such as the intimacy of heritage trolley cars, greater pedestrianism and encounters associated with access and waits at transit stops increase the likelihood of social interactions. Personal and public identifications with these experiences provide for a social dimension of identity that is distinctive to the streetcar community. In their study of new urbanist social behavior, Kim and Kaplan considered community identity to be engendered by: a) uniqueness or distinctiveness; b) residents maintaining a link between past and present environments—imagery of an earlier era of the streetcar; c) "significance or pride" associated with the place that one identifies with; d) compatibility with one's lifestyle; and e) "cohesiveness" with the character of the community (Kim & Kaplan, 2004).

As stated by Charles A. Hales, a transit planning executive with HDR Engineering, “the streetcar movement is not a transportation movement, it’s a development movement with transit benefits” and “it’s at least as much about development as it is about transit.” (Sachs, 2008). Accordingly, this research explores the related effects of community identity and social interaction among the residents in streetcar-oriented developments.

CHAPTER III

METHODOLOGY

The purpose of this study was to explore whether heritage streetcar systems foster feelings of enhanced community identity and to examine the effects of heritage streetcar service upon the social interaction of residents in streetcar-oriented developments. The perception of heritage streetcars as an amenity as compared to actual usage was also explored with research centered upon the residents' likes and dislikes of heritage streetcars and their related travel behavior. The methodology for the data collection, analysis and narrative of the dissertation was based on phenomenology. As a theoretical approach in social research, phenomenology seeks to understand how human beings experience the environment they create and inhabit (Singleton and Straits, 2005).

A mixed-methods research approach was selected for the research inquiry. Mixed-methods research is appropriate when the researcher seeks to add breadth and scope to a project and gain a fresh perspective of a particular phenomenon (Greene, Caracelli & Graham, 1989). By combining qualitative and quantitative methods, a researcher evaluates the same research question but advances two approaches simultaneously that lead to a triangulation or convergence of the research (Morse, 1991).

A mixed-methods strategy was well-suited for this research as one of the objectives of this dissertation was to explore and reconcile how the underlying travel behavior and the physical characteristics of heritage streetcars influenced the feelings of community identity and contributed towards social interaction among residents in streetcar communities. Additional research questions arose from the survey results that

were integrated into open-ended questions of the interviews that enabled the author to reconcile the travel patterns and streetcar characteristics to the findings related to community identity and certain social activities.

A sequential design was selected for this dissertation's mixed-methods research design (see Figure 3.1 below). A priority was placed upon collecting the quantitative data from the survey as the initial phase of the research followed by the integration of the qualitative data analysis derived from the follow-up interviews. The collection and analysis of the survey results enabled the author to explore research findings that were unanticipated or probe for a broader perspective than revealed in the survey results. By sequencing the mixed-methods design with the qualitative phase following the quantitative analysis, the author was able to examine certain aspects of the data in more detail. As a straightforward strategy with mixed-methods research, a sequential strategy provided the advantage of two distinct phases of data collection with the ability to integrate the data during the interpretative phase of the research (Creswell, 2003).

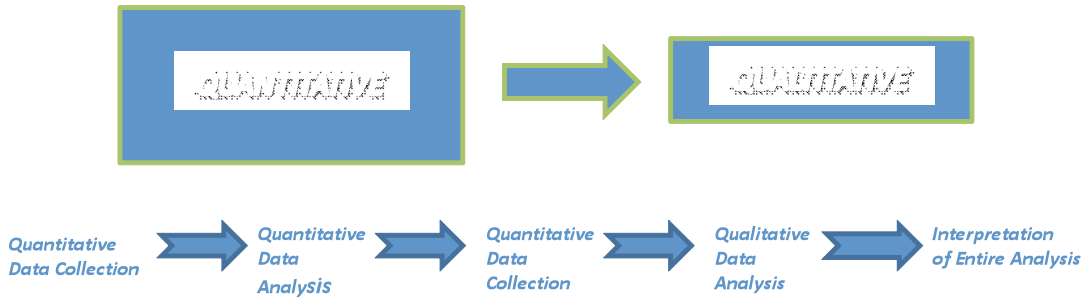


Figure 3.1. Mixed-Methods Research Model. (Source: Creswell, 2003, p. 213)

The quantitative methodology consisted of survey research with a mailed survey instrument administered in two study sites (Memphis and Little Rock/North Little Rock) while the qualitative methodology consisted of follow-up interviews to gain a broader perspective from the respondents and additional insight from real estate developers, transit officials and planners within the subject communities.

Methodological Framework

Survey research provides the best approach for a social researcher to collect data for a sample describing the characteristics of a large population (Babbie, 2008). The exploratory nature of the proposed research considers individuals who reside in streetcar-oriented developments, to be the units of analysis.

The methodology was derived from two theoretical dimensions, community identity and social interaction. Community identity is defined as the sense of attachment, distinctiveness and pride a resident feels for the neighborhood. Social interaction is defined as the informal, formal and community activities among residents of the streetcar-oriented developments. The survey was designed to analyze three variables—the streetcar (independent variable), community identity (dependent variable), and social interaction among the residents (dependent variable). The methodology was intended to provide the research data to determine whether residents of streetcar-oriented developments feel an enhanced sense of community identity and enjoy a greater sense of social interaction as a result of the character-defining features of the streetcar.

Operational Definition for Community Identity

This dissertation explores the hypothesis that the physical characteristics of heritage streetcars and streetcar-oriented developments convey a sense of character that fosters unique dimensions of identity. Accordingly, the research seeks to determine if there is a link between heritage streetcars and community identity that is engendered by: a) a tangible link between the past and present (Alexander et al., 1977; Lynch, 1981; Mumford, 1961; b) distinctiveness (Kim & Kaplan, 2004; Twigger-Ross & Uzzell, 1996); and c) sense of attachment—"happy to belong", an implied feeling of community (Rothenbuhler et. al, 1996; Kim & Kaplan, 2004).

The theoretical dimensions and indicators that engender community identity are shown below and detailed in Table 3.1.

Theoretical Dimension—Community Identity

- Attachment to the past and present with heritage streetcars
- Feeling of distinctiveness
- Sense of pride

Indicators

- Attachment to the past with the streetcar as a tangible link to a community's heritage.
- Attachment to one's current, streetcar-oriented community.
- Feeling of distinctiveness—Indicators include an increased awareness of distinctiveness or "being different" from others as a result of the association with a particular community served by the streetcar (Kim & Kaplan, 2004; Twigger-Ross & Uzzell, 1996).

Table 3.1. Theoretical Dimension and Indicators of Community Identity.

Construct	Dimension	Indicators	Examples of Indicators
Character-defining attributes and physical characteristics of the streetcar system	Community identity	Attachment to the past with heritage streetcars	Awareness of local history and historic resources. Attachment to the streetcar as a tangible link to a community's past
		Attachment to one's current neighborhood with heritage streetcars	Feeling more attached than a previous, non-streetcar neighborhood
		Feeling of distinctiveness	Implied feeling of being unique in a particular neighborhood because of streetcar characteristics
		Sense of pride	"Happy to belong" and greater sense of satisfaction with being a part of a community

- Sense of pride—An implied feeling of belonging to a particular community i.e. "happy to belong" (Kim & Kaplan, 2004; Rothenbuhler et al., 1996).

Operational Definition for Social Interaction

Within the context of this research, an operational definition of social interaction consisted of the informal, formal and community activities among residents of the streetcar-oriented developments. These activities were selected as indicators within the theoretical dimension of social interaction and defined in more detail below.

Social interaction was examined with a) neighboring behaviors—interactions between residents within the same development or same block (Podobnik, 2002; Kim & Kaplan, 2004; Buckner, 1988; Glynn, 1986; Festinger, Schachter, & Black, 1950) and; b) the relationship of the physical characteristics of heritage streetcars and the residents in streetcar-oriented developments that affect the opportunities for social interaction (Alexander et al., 1977; Lund, 2003; Dunphy et al., 2004).

The theoretical dimensions and indicators that engender social interaction are shown below and detailed in Table 3.2.

Theoretical Dimension – Social Interaction

- Informal interactions
- Formal (planned) interactions
- Community participation

Indicators:

- Informal interactions—Indicators were unplanned activities resulting from spontaneous actions between neighbors* such as sitting together, waiting together at the streetcar stop or walking together to and from the streetcar. Other indicators were subsequent activities that were previously unplanned but arranged while riding the streetcar such as deciding to meet later for coffee or visiting a retail shop together.

- Formal interactions—Indicators were planned activities between neighbors* such as a pre-arranged lunch date or biking together. These were activities that resulted from a planned engagement that one neighbor initiates and would not be considered simultaneous with informal interactions as defined above.

- Community participation—Indicators were group activities designed to engage neighborhood or community participants. Examples included neighborhood association meetings, church activities, school functions such as PTA and civic hearings.

Table 3.2. Theoretical Dimension and Indicators of Social Interaction.

Constructs	Dimension	Indicators	Examples of Indicators
Characteristics of heritage streetcars and physical design of streetcar-oriented developments	Social Interaction	Informal interactions	Spontaneous activities such as meeting a neighbor and engaging in conversation, sitting together on the streetcar or walking to the streetcar stop together.
		Formal (planned) interactions	Pre-arranged activities such as lunch dates or shopping together.
		Community participation	Attending community functions such as PTA meetings, church activities, neighborhood association meetings or civic hearings.

*Neighbors were defined as residents who resided within the same development or within the same neighborhood as distinguished by the name of the neighborhood or in the absence of a name, that area within a ten-minute walk.

Study Sites

Two study sites, Memphis and Little Rock/North Little Rock, were selected based on the characteristics of their respective heritage streetcar systems and the scope of streetcar-oriented development activity that has occurred in recent years. Both markets have received considerable exposure within popular media sources such as the *New York Times* which reported on Little Rock's downtown development activity in 2004 that coincided with the reintroduction of streetcar service (Ohland & Poticha, 2008). As the research was centered on the perceptions and behaviors of residents in streetcar-oriented developments or neighborhoods, the study sites were selected after site visits and

interviews were conducted with real estate developers and planners in the study sites. A demographic analysis was also conducted to determine whether similar characteristics existed within the two study sites. Although the Metropolitan Statistical Area (MSA) of Memphis represents a considerably larger market with a 2008 estimated population of 1,285,732 as compared to the Little Rock/North Little Rock Metropolitan Statistical Area 2008 population of 666,401, other demographics are similar (U.S. Census Bureau, 2008 Population Estimates). A summary of the key demographic categories is shown below in Figure 3.2 and Table 3.3:

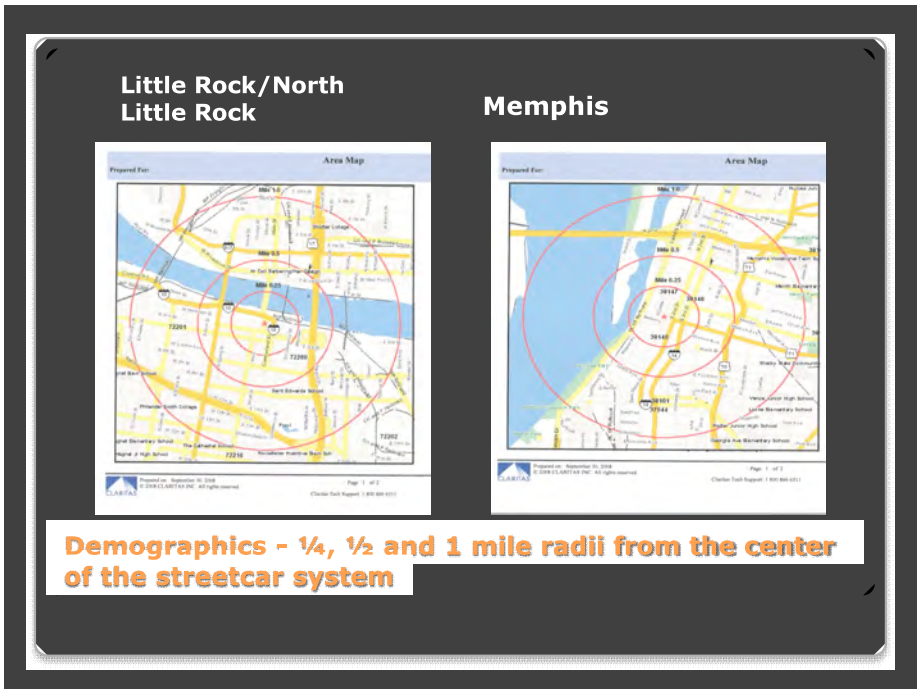


Figure 3.2. Geographical Area for Demographic Analysis. (Source: Claritas, Inc., 2008)

Table 3.3. Comparison of Key Demographic Categories in Study Sites.

	Little Rock (1/2 Mile Radius From Epicenter of Streetcar System)	Memphis (1/2 Mile Radius From Epicenter of Streetcar System)
Number of Households	522	1,256
Owner vs. Renter	13.6% - Renter 86.4% - Owner	15.61 – Renter 84.39% - Owner
Average Household Size	1.4	1.4
Racial Mix – White vs. Non-White	40.85% - White 59.15% - Non-White	30.07% - White 69.93% - Non-White
Average Household Income	$29,307	$52,394

(Source: Claritas, Inc., 2008)

Little Rock/North Little Rock

The River Rail Streetcar system project was conceived as an economic development strategy to better link the downtowns of Little Rock and North Little Rock, AR, on opposite sides of the Arkansas River. With respective 2007 populations of approximately 187,452 and 59,452, both cities desired a circulator mode of public transit that would provide improved connectivity between the area's major attractions including the Clinton Presidential Library, the redeveloped River Market area and a new 18,000-seat sports and entertainment area.

Little Rock's first electric streetcars system, City Electric Street Railway, commenced operations on November 22, 1891, with twelve, single-truck streetcars that were described as "…magnificent rapid-transit vehicles which were painted a bright yellow, electrically lighted and cost $3,300 each..." (Brown, 1947, Unnumbered page–*Special Features Editorials*). By 1910, Little Rock had grown to a population of approximately 45,000 and the streetcar system offered seven routes that covered the city

from the state capitol to the Hebrew and Oaklawn cemeteries on the fringe of downtown (Brown, 1947). At its peak in 1921, the Little Rock streetcar system was lavishly praised by the *Arkansas Democrat* for its public benefits by providing:

> "…health, fresh air, room to breath, life to the invalid, joy to the children, [it] made life in crowded cities endurable. It permits the poor toiler, as well as the people of means, to live where they are not cabined, cribbed, confined in congested sections. It has brought suburbs to what heretofore had been distant from the city too far to make practical residence therein. It has tremendously increased real estate values by making acre property and worn-out fields available for residence property. Increasing real estate values, it has increased its taxable value, more public monies are thus collected and the whole community benefits beside those more directly interested..." (Arkansas Democrat, 1921, 1).

The success of Little Rock's City Electric Street Railway led to neighboring Argenta (now North Little Rock) starting an independent streetcar system in 1908 with two routes (Brown, 1947). The Argenta streetcar system flourished before a gradual decline and cessation of operations in 1939, while Little Rock's system operated until Christmas Day, 1947 (Ehrlich, 2004).

Plagued by urban core issues that included racial polarization, commercial out-migration and high crime, Little Rock attempted several revitalization strategies that included failed attempts with a pedestrian mall and the ill-fated Diamond Center, a mixed-use retail and sports center that was not built. By the early 1990s, a planning initiative known as Future Little Rock began planning the River Project to create residential, office and recreational activities in downtown along the Arkansas River. Community leaders visited Portland, Oregon as part of the planning process, thereby creating awareness of rail transit as a catalyst for development activity. The focus of the

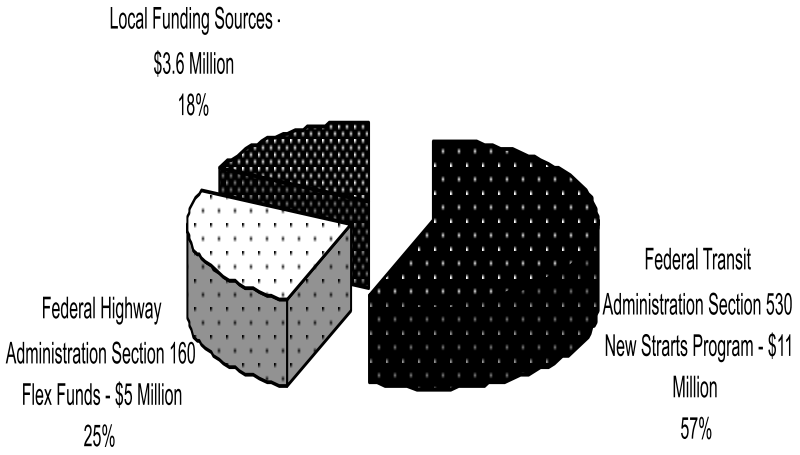
planning initiative was also to improve connectivity between downtown Little Rock, the new Clinton Presidential Library, and North Little Rock, home of the new Alltel Arena and the recently completed Arkansas Travelers minor league baseball park. The concept of a streetcar to improve the connectivity between the two cities was proposed. A coalition of business and political leaders from both cities began exploring funding options and designed the streetcar route (Wilson, 2006).

The funding for the first phase eventually totaled $19.6 million and was a combination of 80% federal and 20% local sources. Table 3.4 shows a breakdown of the funding sources.

In November 2004, streetcar service was reintroduced with a 2.5 mile system in the River Rail district and crossing the Arkansas River to North Little Rock. T he service has since been expanded another .09 miles to the Clinton Presidential Library and the Global Village Center of Heifer Project International. The second phase costs were approximately $6 million and operating costs have been approximately $650,000 annually (Kimley-Horn, 2007). The streetcars operate in mixed-traffic on city streets and cross the Arkansas River on a bridge with an exclusive lane for the streetcars.

Although the full impact of streetcar service is unclear regarding its role with Little Rock's downtown revitalization, development activity has exceeded $200 million since 2004 with numerous condominium and apartment projects that include the adaptive use of historic buildings and new construction. The *New York Times* profiled the streetcar-oriented development of Little Rock in late 2004 with the following description:

Table 3.4. Little Rock Streetcar Funding Sources.



"New hotels have been opened and old ones have been restored. Museums and galleries have attracted big-city-caliber collections, and condominiums and restaurants breathe new life into old warehouses and storefronts." (Ohland & Poticha, 2007).

Little Rock's streetcars are replica trolleys manufactured by the Gomaco Trolley Company based on the double-truck Birney model streetcars that operated in Little Rock until 1947 (see Figure. 3.3). Like vintage streetcars, the Little Rock replica cars are designed to serve short trips with transit stops approximately every 1,000 feet (Smatlak, 2006). Operating at speeds of eight to ten miles per hour, the streetcars are powered by overhead electrification through a catenary. The air-conditioned replica cars have wood-dominated interiors and improved ride quality over the vintage cars. The cost of the streetcars was approximately $750,000 each and savings were realized with the use of rebuilt motors, controllers and other equipment that were recycled from 1920 Italian streetcars (Kimley-Horn, 2007). The heritage streetcars have become a visible symbol for both cities and are heavily used in promotional material for tourism and economic

Figure 3.3. Little Rock River Rail Streetcar at the River Market. (Photograph by Robert Benedict)

development activities (see Figure. 3.4). The popularity of the heritage streetcars is evidenced by ridership exceeding projections in recent years including 133,321 passengers in 2007. After years of steadily increasing ridership, 2008 was a year of declining streetcar ridership with 112,578 passengers—a decline of 15.56% from 2007 and attributed to fewer events and festivals combined with adverse economic conditions that resulted in fewer out-of-town visitors in 2008 (Fry, Central Arkansas Transit System, 2009).

Sample Selection—Little Rock/North Little Rock

The identification of suitable developments for the survey research began with parameters based on Calthorpe's definition of transit-oriented development that specifies an average walking distance of 2,000 feet from a transit stop. The average 2,000-foot

Figure 3.4. Central Arkansas Transit System Streetcar Map.

radius represents a "…comfortable walking distance which is approximately a ten minute walk for most people…" as shown in Figure 3.5 (Calthorpe, 1993). Subsequent research regarding territorial definitions has established a consensus that the spatial extent of transit-oriented development should extend between a quarter-mile and a half-mile from a transit station or stop (Cervero et al., 2002). Although the optimal walking distance to a transit stop and a place of employment is less than 1,000 feet, residents are willing to walk slightly longer distances up to a half-mile to access transit (Daisa, 2004). A review of transit agency manuals by Robert Cervero, Christopher Ferrell and Steven Murphy for

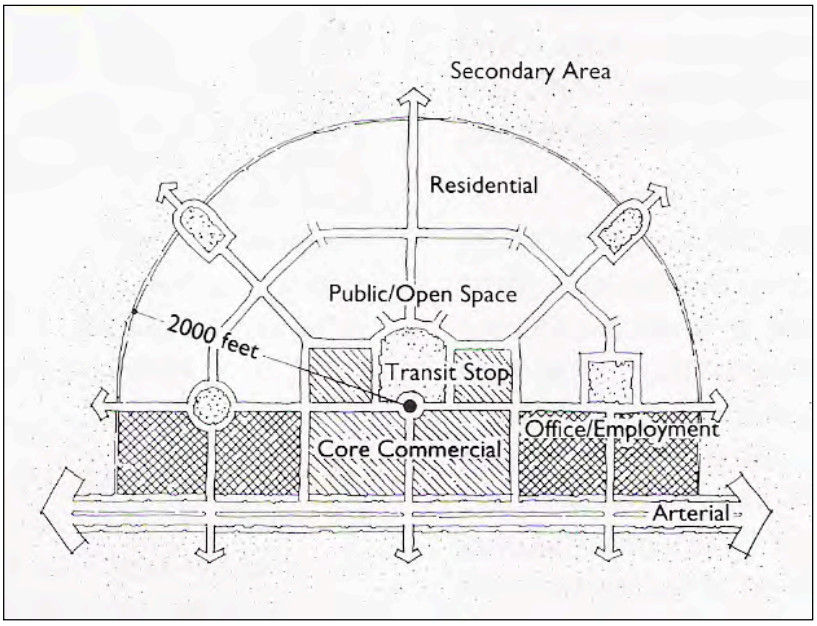


Figure 3.5. Peter Calthorpe's Defined Area for Transit-Oriented Development. (Source: Calthorpe, P. *The Next American Metropolis)*.

the Transportation Research Board also revealed a consensus among jurisdictions for TOD district boundaries based on walking distance requirements of a leisurely five-to-fifteen minute walk (2002). Accordingly, a maximum boundary parameter of 2,000 feet was used for the selection of the desired developments and neighborhoods for survey participation. A site visit was conducted in March 2008 that resulted in a list of targeted developments meeting the distance requirement. Subsequent interviews with developers, planners and transit agency officials also helped identify suitable developments and neighborhoods.

The following streetcar-oriented developments in Little Rock and North Little Rock met this requirement and, following approval by the landlord or respective neighborhood association, were included in the study as shown in Figures 3.6-3.11:

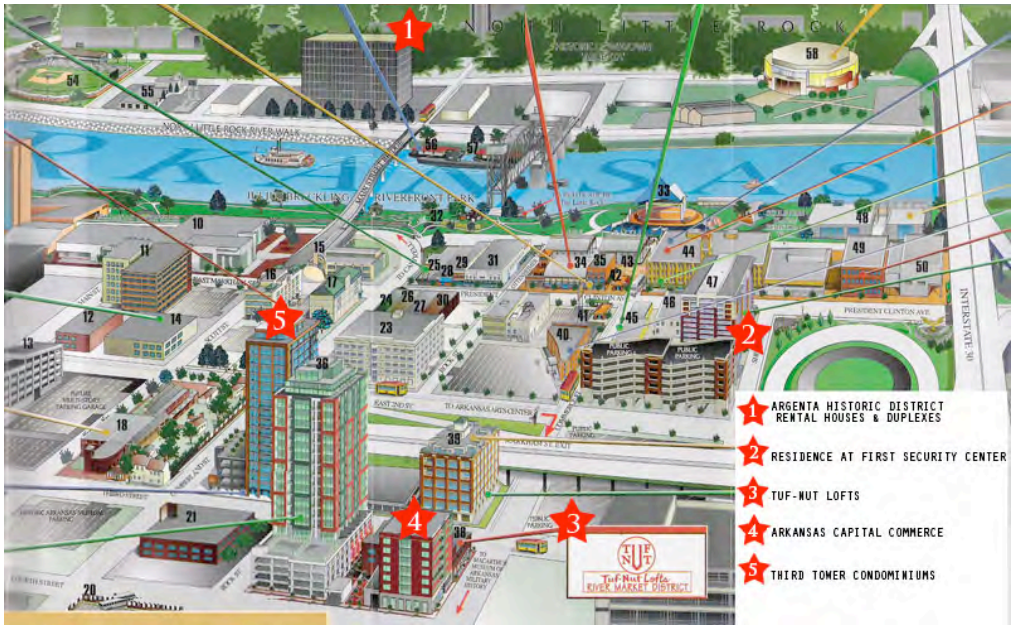


Figure 3.6. Participating Little Rock and North Little Rock Developments and Neighborhoods in Survey Research.

Figure 3.7. Argenta Historic District. (Photograph by Robert Benedict)

Figure 3.8. The Residences at First Security Center (Photograph by Robert Benedict)

Figure 3.9. 300 Third Tower (Photograph courtesy of Harding Construction Company)

Figure 3.10. Tuf-Nut Lofts. (Photograph by Robert Benedict)

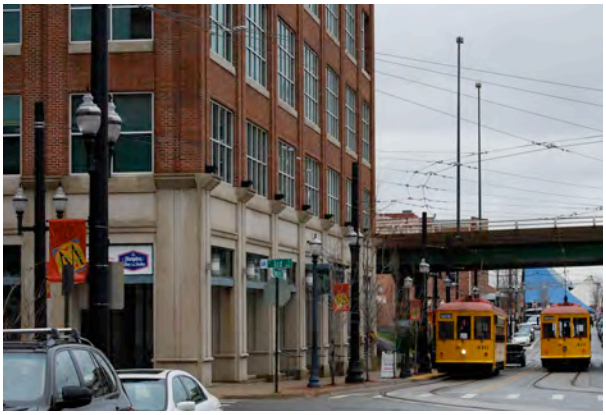


Figure 3.11. Arkansas Capital (Commerce Center) Condominiums. (Photograph by Robert Benedict)

Sample participants were selected from resident information provided through the respective neighborhood association, developers of the aforementioned properties or from

the property management firms affiliated with the property owner. The contact and approval procedures are detailed in the implementation of the survey research section.

Memphis

The origin of electric streetcar service in Memphis dates back to October 5, 1890, when a trial run of an electric streetcar was conducted on Main Street. The successful event led to full service becoming available on September 22, 1891. By 1927, the city's population was approaching 250,000 and the Memphis Street Railway Company operated 200 cars that carried approximately 144,000 passengers per day which equated to an annual ridership exceeding 52 million passengers. The Memphis Street Railway Company was also a significant contributor to the local economy with over 1,000 employees and a payroll of $1,413,277 (*Memphis Service News*, 1927).

The social impact of the streetcar was vividly captured by former General Superintendent A.D. McWhorter during an address to the Memphis Engineers Club where he recalled the appeal of the streetcar and the diversity of its passengers:

> "…Our passengers are comprised of all sorts, ages and conditions of people; men, women and children; the superannuated and the newly-born; the white, the black and the yellow; the halt, the lame, the blind, the decrepit, the exuberant; the drunk, the sober; people of all sorts of dispositions, humors and tempers; the well and dyspeptic; the educated and the ignorant; the even-tempered and the irascible; the happy natured and the grouch..." (*Memphis Service News*, 1927, 1-2).

However, shortly thereafter streetcars began falling out of favor with the increased popularity of the automobile and the emergence of buses as the preferred mode of public transit. By 1935, the Memphis Street Railway began a gradual transition to

buses and by 1947 all of the streetcars had been replaced by electric coaches or buses (*Memphis Press*, 1947).

By the 1960s, downtown Memphis was suffering from the same issues that other urban centers faced including the loss of department stores, racial polarization and an out-migration of employment centers to the suburbs. A 1971 comprehensive plan for the downtown area proposed converting Main Street into a pedestrian mall. Looking for complementary transit options, interest began growing for the use of streetcars as a circulator mode linking downtown with the medical district and the Beale Street entertainment district. Unfortunately, the proposed streetcar project was abandoned due to cost estimates that exceeded $6 million per mile. The Mid-America Mall was developed as a redevelopment strategy for Main Street but it became increasingly apparent during the 1980s that the mall's retailers suffered from inconsistent sales and the mall began deteriorating physically. Conceived as a pedestrian mall, the Mid-America Mall also suffered from design issues that included too long of a walk and customer complaints over the lack of convenient parking. The newly-formed Center City Commission was directed to formulate a strategy to promote redevelopment and proposed an Interstate Highway connector to funnel more traffic into downtown. Other options included adding rubber-tired buses on Main Street and a people-mover to connect proposed housing in the South Bluffs area to downtown (Wilson. 2006).

However, in 1989, Hnedak Bobo Group released a landmark study that proposed a vintage streetcar system to revitalize the largely vacant pedestrian mall. The Hnedak Bobo study was supported by Mayor Richard Hackett and later by city council after

initially rejecting the streetcar plan. The Hnedak Bobo plan proposed connecting the Main Street mall area with the medical district, the South Main Arts District, the new Pyramid Arena and the Pinch District, an emerging residential area north of downtown (Wilson, 2006).

Streetcar service was reintroduced in Memphis when the Main Street Trolley initiated service in 1993 with a 2.5 mile route largely based on the Hnedak Bobo proposal. The streetcar service has since been expanded on two occasions with the Riverfront Loop in 1997 and the Medical Center Extension in 2004 which more than doubled the service area (Wilson, 2006). The Memphis streetcar fleet consists of rehabilitated cars from Melbourne, Australia; Oporto, Portugal; and one replica streetcar (APTA Streetcar and Heritage Trolley Site, 2003). The cost of the first phase was $34,887,072 ($14.9 million per mile) but 45% of the costs ($15,834,000) were allocated for improvements to the pedestrian mall on Main Street (Weyrich & Lind, 2002). The 20-car Memphis fleet is largely vintage cars consisting of six Portuguese models, twelve from Melbourne, Australia, one Birney antique car and a Brill replica car (Memphis Area Transit Administration, 2007).

Financing for the initial phase of the Memphis streetcar project included federal, state and local funding sources. Approximately $24 million of federal funding for the project originated with the Interstate Substitution Program that became available when the proposed extension of Interstate 40 through downtown Memphis and Overton Park was abandoned. An additional $3 million was provided through a Federal Transit Administration grant while the Tennessee Department of Transportation provided $2.5

million and the City of Memphis funded $4 million. Private sources and Memphis Area Transit Authority funded the remaining $1.4 million (Wilson, 2006; Memphis Area Transit Authority, 2007). The subsequent phases utilized similar funding models. The 1997 Riverfront extension cost $9.6 million ($3.8 million per mile) and the funding sources were also a combination of federal, state and local sources. The third phase was the 2.5 mile Medical Center extension along Madison Avenue. Completed in 2004, the construction costs were dramatically higher on this phase due to a seismic retrofit of a bridge, the construction of another bridge and a corridor infrastructure design that would allow for integration into a future light-rail project that would connect the Memphis downtown to the airport (MATA, 2004; Wilson, 2006).

As shown in Table 3.5, ridership has steadily increased on the Memphis streetcar system rising from 468,115 the first full year of operation in 1994 to 1,060,410 in 2008, an average of 2,905 riders per day (Lancaster, 2009). Ridership decreased slightly less than 2% in 2008 from 2007. According to John Lancaster, Manager of Planning for Memphis Area Transit Authority, this was the result of a weakening economy and fewer out-of-town visitors. The Memphis streetcar system operates under the Memphis Area Transit Authority and appears to be efficiently managed with modest operating costs. An American Public Transportation Association (APTA) study of twenty light rail and streetcar systems ranked Memphis' operating costs 15th (20th was lowest) per vehicle mile and 19th per vehicle hour (APTA; Weyrich & Lind, 2002).

Table 3.5. Memphis Streetcar Ridership.

(Source: Memphis Area Transit Authority)

Coinciding with the reintroduction of heritage streetcar service, downtown Memphis has benefited from considerable development activity including extensive residential activity around Central Station, a historic mixed-use structure that currently houses Amtrak. There have been approximately 28,000 new residents in downtown Memphis within the past decade. The residential growth has been complemented by completion of the FedEx Forum (home of the Memphis NBA Grizzlies and the University of Memphis Tigers basketball team), the Auto-Zone Park baseball stadium (home of the AAA Redbirds), numerous hotels and restaurants. The Beale Street Entertainment District is a popular destination for tourists and the South Main Arts District has emerged as a popular area for galleries and specialty retail with extensive adaptive use projects of historic properties into residential lofts. The development activity in the South Main Arts District helped create one of the more popular streetcar

events with a "trolley tour" of art galleries and art studios on the last Friday of each month (Woodward, 2009; Kitsinger, 2009). Although the extent of the streetcar's impact is unclear, Center City Commission Executive Director Andy Kitsinger describes the streetcar as a recognizable symbol "along with the Pyramid and the Mississippi River Bridge" (Kitsinger, 2009).

Sample Selection—Memphis

The selection of the Memphis streetcar-oriented developments for the survey research also followed Calthorpe's criteria for transit-oriented development (within 2,000 feet of the transit stop) with suitable properties identified during a site visit in July 2008, combined with interviews with real estate developers and planning officials (see Figure. 3.12). Properties were identified in two primary areas along the streetcar route as shown in Figures 3.13-3.18 consisting of Main Street developments near the intersection of Madison Avenue and additional developments within the South Main Arts District. Both areas have experienced extensive development activity within recent years and offer a diverse range of rental and fee-simple, ownership units. Given the historic character of both areas, the developments are historic rehabilitations by some of the best known developers in Memphis. The map below, Figure 3.12, shows the location of the developments that agreed to participate in the survey research.

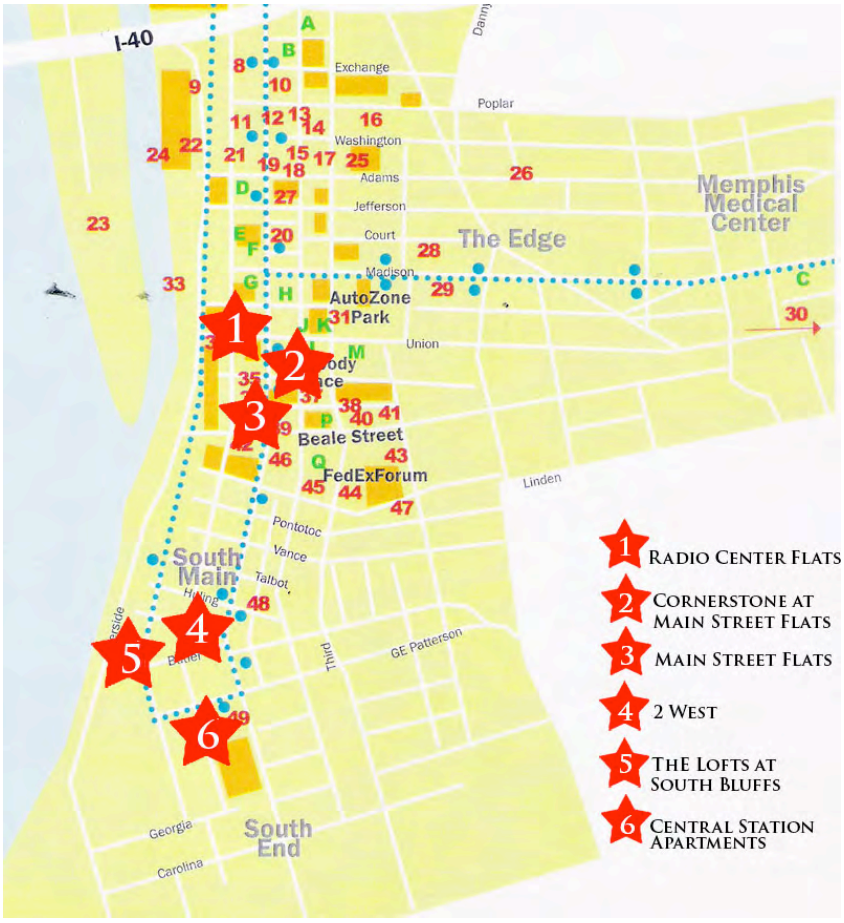


Figure 3.12. Participating Memphis Developments in Survey Research.

Figure 3.13. Main Street Flats. (Photograph by Robert Benedict)

Figure 3.14. Radio Center Flats. (Photograph by Robert Benedict)

Figure 3.15. Cornerstone Flats at Main Street. (Photograph by Robert Benedict)

Figure 3.16. The Lofts at South Bluffs. (Photograph by Robert Benedict)

Figure 3.17. 2 West Condominiums. (Photograph Courtesy of Woodward Properties)

Figure 3.18. Central Station Apartments. (Photograph by Robert Benedict)

Implementation of Survey Research

The survey instrument was designed to elicit responses from the residents in the aforementioned streetcar-oriented developments and neighborhoods. The questions were carefully worded to explore the effects of the streetcar upon with the perceptions and attitudes of the residents as related to the theoretical domains of community identity and social interaction. The basic premises of Dillman's "respondent-friendly questionnaire" were followed to create a questionnaire that was easy to comprehend and in an order that conveyed a degree of high salience (Dillman, 2000). Questions that pertained to *community identity* had a Likert Scale format with response options of: 5 = Strongly Agree, 4 = Agree, 3 = Neither Agree Nor Disagree, 2 = Disagree, 1 = Strongly Disagree. A similar Likert Scale matrix was created for the response options to the questions that addressed social interaction. The respondents were asked about the frequency of social activities within the past 30 days with such questions as "…Talked with a neighbor I already knew while riding on a streetcar…" The response options for these questions were: 1 = None, 2 = 1 to 3 times, 3 = 4 to 10 times, 4 = 11 to 25 times, 5 = More than 25 times and an additional response option for "Don't Know or Not Applicable."

Additional questions were provided to gather demographic information, travel behavior and likes and dislikes of the physical characteristics of the streetcars. The demographic questions included the respondent's birthdate, income ranges, and household characteristics. The questions pertaining to household characteristics included whether the respondent owned or rented their residence, if they were a head or co-head of

the household, number of adults and children in the household and how long the respondent had resided at their current residence.

The survey was revised numerous times and subjected to a pretest before it was edited to its final form. Dr. Jeff Hallo of Clemson University's College of Parks, Recreation and Tourism Management served as the survey advisor and provided considerable input. Dissertation committee members, especially committee chairman Dr. Barry Nocks, also offered suggestions during the review of the survey. The survey and cover letter were reviewed by the Clemson University Office of Research Compliance and with several minor revisions, approved for the pretest and mailing of the final survey.

The pretest of the survey was administered in Charlotte to residents in three transit-oriented developments. The developments were selected for their similar physical characteristics to some of the targeted developments in Memphis and Little Rock. The pretest survey also contained questions regarding the length of the survey, clarity of the questions and the interest level of the survey material. Based upon the pretest data analysis, several questions were slightly revised to improve their clarity.

Simultaneously with the pretest, extensive contact was made with the landlords and neighborhood association officers of the targeted developments and neighborhoods in Memphis and Little Rock/North Little Rock. Personal meetings were held with some of the owners and landlords during site visits in March and July of 2008. Extensive telephone and electronic mail communication was also conducted before formal permission was granted by a total of twelve developments and one neighborhood association within the applicable cities. Conditional approval for participation in the

survey was granted by six developments due to confidentially policies of the landlord. For the properties with restricted resident information, the surveys and cover letters (without the resident's name) were mailed to the landlord and were distributed door to door by the property manager. Several of these developments agreed to promote the survey through the development's newsletter and in one instance, allowed the researcher to write a letter encouraging resident participation in the upcoming survey research. The other six developments and one neighborhood association released the names and addresses of the residents thereby allowing for a direct mailing of the survey and personalized cover letters. The surveys had stamped, self-addressed envelopes allowing for easy return mailing. All envelopes, the cover letter and the survey had the Clemson University approved logo to legitimize the academic purpose of the research. Letters were also sent thanking the respondents for their participation or if a survey had not been returned, a letter was sent reminding the resident of the importance of the survey with an offer to send a second survey. While obtaining the approvals for survey participation, the landlords and neighborhood association officers were assured of the confidential and voluntary nature of the survey. This was also stated in the cover letter accompanying the surveys and contact information was provided for questions about the survey.

As an incentive to complete and return the survey, the cover letter disclosed that a monetary donation of $5 (per survey) was to be made in the respondent's name to a local nonprofit entity. Prior to selecting the nonprofit, contact was made with the respective nonprofit development officer or executive director to explain the purpose of the research and obtain their permission to participate as the beneficiary of the donations. For Little

Rock, Historic Arkansas Museum was selected while in North Little Rock, Argenta Downtown Council agreed to participate. Both nonprofits were endorsed by community leaders and the nonprofits also expressed strong interest and support for the research. In Memphis, Memphis Heritage, Inc. was selected as the recipient of the survey donations. This nonprofit is actively involved in historic preservation activities throughout Memphis and has been a leading advocate of preserving the historic character of downtown Memphis. Memphis Heritage, Inc. also enthusiastically supported the research and offered their archival resources to assist the research. To ensure the anonymity of the respondents, the questionnaire allowed the respondent the option of foregoing the donation or having an anonymous donation.

Following the approval and preparation process of the surveys, 502 surveys were mailed in late November and early December 2008 to the residents or to the landlord if a confidentially policy precluded a direct mailing. 143 surveys were returned for a response rate of 28.5%. A breakdown of the responses by community is shown in Table 3.6.

The higher response rates in Memphis and North Little Rock were attributed to a majority of the communities within these cities allowing direct mailings with personalized correspondence and personalized follow-up letters.

Interviews

As part of a mixed-methods research design, interviews are a qualitative strategy that is derived from interpretivism, as defined by Thomas Schwandt with a "…goal of understanding the complex world of lived experience from the point of view of those who

Table 3.6. Breakdown of Survey Responses.

Development/Neighborhood	Number of Units	Number of Responses
The Lofts at South Bluffs (Memphis)	120 units	34 (28.33%)
2 West (Memphis)	10 units	6 (60%)
Main Street Lofts (Memphis)	33 units	14 (42.42%)
Cornerstone at Main Street (Memphis)	15 units	6 (40%)
Radio Center Flats (Memphis)	14 units	6 (42.86%)
Central Station Apts. (Memphis)	56 units	10 (17.9%)
The Residences at First Security Center (Little Rock)	24 units	1 (4.2%)
300 Third Tower (Little Rock)	90 units	12 (13.3%)
Tuf-Nut Lofts (Little Rock)	31 units	9 (29.03%)
Arkansas Capital Commerce Center (Little Rock)	14 units	5 (35.7%)
Market Row (Little Rock)	3 units	0 (0%)
Argenta Historic District (Houses and apts. in North Little Rock)	95 units	40 (42.1%)
Totals	**502**	**143 (28.5%)**

live it…" (Groat & Wang, 2002). Within the context of this research proposal, "…those who live it…" were considered to be the residents of streetcar-oriented developments as well as real estate developers actively involved in streetcar-oriented developments, city planners and key members of the streetcar management team.

Accordingly, follow-up interviews were conducted as the qualitative phase of the methodology. The interviews were in three categories as listed below:

I. Interviews were conducted with seven prominent real estate professionals, who were actively involved in the development, ownership or brokerage of streetcar-oriented developments. The interviews were also face-to-face and

designed to gain further insight into the role of the streetcar with their respective properties. Four of the real estate professionals were in Memphis while three were in the Little Rock and North Little Rock markets. The interviews lasted approximately 1 to 1 ½ hours and helped provide further perspective on the streetcar as a perceived amenity to the streetcar-oriented properties and the marketing advantages afforded by the properties' streetcar access. The questions were open-ended and primarily focused on whether the streetcar helped create a distinctive image of the development and the community. Additional questions addressed whether there was increased social interaction and if effective collaboration existed with local planners and the transit agency in planning the streetcar-oriented developments. Examples of the interview questions for the real estate professionals were:

- What are your views regarding the streetcar as a symbol of community identity as it relates to the contextual image of your streetcar-oriented development (s)?

- What are your views regarding the streetcar as a means of promoting social interaction among the residents in your streetcar-oriented developments?

- What is your perspective of the streetcar as an amenity to the residents of your streetcar-oriented developments?

- As a developer of a streetcar-oriented project or projects, what was your experience collaborating with the transit agency?

- What barriers or negative aspects related to the streetcar system had an adverse impact upon your development plans?

II. Follow-up interviews were also conducted with city planners and transit system executives to gain another perspective regarding the relationship of the streetcar and the real estate developments' residents using streetcar service. Senior management with both transit agencies (Memphis Area Transit Authority and Central Arkansas Transit System) participated in the interviews. Executive directors of planning agencies in both study sites also participated in the interviews. Similar to the real estate professional interviews, questions were designed to evaluate the linkage of the streetcar-oriented developments with the infrastructure of the streetcar system. Examples of questions are:

- How is transit-oriented development encouraged along the streetcar lines? Are there formal or informal programs?

- How does your agency collaborate with developers on transit-oriented developments?

- What characteristics of the streetcar-oriented developments have been effective demand generators for increased streetcar ridership among the affected residents?

- Please tell me about the streetcar as a symbol of community identity as it relates to the image of the streetcar-oriented developments within your service area?

- Please tell me about the streetcar as a means of promoting social interaction among the residents in streetcar-oriented developments within your service area?

- What, if any, obstacles or negative aspects of the streetcar-oriented developments have limited the potential for greater ridership among the residents of the developments?

III. The final phase of the data collection consisted of follow-up interviews with some of the respondents who returned forms indicating their willingness to participate in interviews. Fifteen interviews were conducted with respondents from both study sites. The respondent interviews were conducted over the telephone and served the purpose of accessing respondents' perceptions and meanings thereby providing an opportunity to better understand other persons' construction of reality in their own terms (Punch, 2005). The respondent interviews were supplementary to the surveys and provided additional insight to support the quantitative survey data. A structured interview was utilized with pre-established questions. However, the wording of the questions allowed for open-ended responses allowing the researcher to use probe techniques for elaboration. The respondent interview questions addressed the following survey issues:

- What is it like to live in a streetcar-oriented development (neighborhood)?

- What are some aspects of living in a streetcar-oriented development (neighborhood) that you like or dislike that may not have been asked in the survey?

- What are your views of the streetcar as an amenity to your development (neighborhood)?

- Survey responses of “other” that warranted additional probe questions such as “I noticed that you answered (the response was cited). Can you tell me more about this?”

There were numerous comments incorporated into completed surveys that expressed support and encouragement for the researcher. Similar comments were often expressed during the follow-up interviews and the interviews often covered a wide range of personal experiences related to streetcar usage.

The following chapter provides the research findings and discusses the results of the data analysis. The findings are detailed through the use of descriptive statistics with additional insight derived from the follow-up interviews to better understand the feelings of the respondents within the theoretical dimensions of community identity and social interaction related to heritage streetcars.

CHAPTER IV

RESEARCH FINDINGS

This chapter presents a detailed description of the research findings. As referenced in the previous chapter, the study's mixed-methods research strategy relied upon a quantitative approach with a mailed survey to a sample of residents in streetcar-oriented developments and a qualitative approach of personal interviews with respondents, real estate professionals, planners and transit-officials. The analysis of the survey results includes descriptive statistics of the mailed surveys and content analysis of the interviews to extract further insight which provided an additional perspective not revealed through the survey analysis.

Study Population

Residents of streetcar-oriented developments in the two study sites served as the study population for this dissertation. The parameters of the study population were established with Calthorpe's definition of transit-oriented development that specifies an average walking distance of 2,000 feet from a transit stop. The average 2,000-foot radius represents a "comfortable walking distance which is approximately a ten-minute walk for most people" and equates to approximately one-half mile (Calthorpe, 1993). Based on this criterion, the developments and neighborhoods were identified for each study site. In Little Rock and North Little Rock, the 2008 study populations were estimated to be 596 and 182 households respectively while the Memphis households totaled 2,937 for a total study population of 3,715 households. These household estimates for the study

population were derived from several sources including fieldwork by the author, Claritas, Inc. *SiteReports* demographic software, and information provided by agencies such as Downtown Little Rock Partnership, Main Street Argenta and Memphis Center City Commission.

As detailed in Chapter III (Methodology), 502 households were pursued for this research with a mailed survey instrument. I n addition to meeting the aforementioned locational requirements, the 502 households selected for participation in the survey research agreed to provide postal addresses or a means of distribution through the neighborhood association or the property management firm. Additional developments and property owners associations were contacted but declined to grant access to their residents. Of the surveys, 143 were received for a response rate of 28.5%. In order to present statistical estimates of population proportions that agree or strongly agree with questions pertaining to the theoretical dimensions of community identity and social interaction, 95% confidence intervals were constructed from corresponding responses in the sample. The errors in these intervals ranged from $\pm$ 4 % to $\pm$ 8%.

Demographic Analysis

The survey instrument contained six questions that specifically addressed demographic categories of the respondents including year born (age), annual household income (range), ownership or rental of the residence, head or co-head of household, whether children resided in the household and number of adults and children in the household. Two additional questions addressed the length of time that the resident had lived at their residence and where they had previously resided.

There were several limitations with the representativeness of the sample to the study population as the survey results revealed differences in two of the demographic categories of the sample as compared to the demographics of the study sites. Specifically, the household incomes and percentage of owner-occupied households were considerably higher with the sample than the population (Table 4.1). It was the intent of the sample distribution to have approximately a 50/50 split of owner-occupied versus rental units. The demographic analysis of the population revealed a much higher proportion of rental units that can be attributed to lower-income neighborhoods on the fringe of the defined study area served by the streetcar systems. These differences were anticipated with the surveyed developments and neighborhoods in closer proximity to the streetcar route and with locational advantages resulting in higher property values and a greater percentage of condominiums within the sample than the surrounding properties. Several demographic categories were evaluated with statistical tests to examine the representativeness of the sample to the population. The results of chi-square tests for the demographic categories of "children residing in the household" (*p value* of 0.605 $\geq$ .05: alpha) and "annual household income" (*p value* .826 $\geq$ .05: alpha) indicated no statistical difference between the sample demographics to the population for these categories

In order to determine whether the survey response rates from the study sites were site-independent, a chi-square test at alpha = .05 was performed. Whereas Table 4.2 showed the survey response to be site independent, Table 4.3 indicates that relative to the two populations, the response rate was site dependent. This can largely be attributed to the smaller response out of a larger population in Memphis.

Table 4.1. Demographic Characteristics of the Sample.

Question	Little Rock/North Little Rock Survey Respondents		Memphis		Sample Totals			Population Totals* (Claritas *SiteReports*)
Age	Under 20	0	0	0	0	0	0	Median ages:
	20-29	8	13.11%	28	40%	36	27.48%	
	30-39	11	18.03%	27	38.57%	38	29.01%	Little Rock/North Little
	40-49	11	18.03%	9	12.86%	20	15.27%	Rock – 41.9
	50-59	18	29.51%	3	4.29%	21	16.03%	
	60-69	11	18.03%	2	2.86%	13	9.92%	Memphis – 45.6
	70-79	1	1.64%	1	1.43%	2	1.53%	
	Over 80	1	1.64%	0	0	1	.76%	
Head or Co-Head of Household	Yes	63	96.92%	73	97.33%	136	97.14%	NA
	No	2	3.08%	2	2.67%	4	2.86%	
Own vs. Rent	Own	46	69.7%	22	28.95%	68	47.89%	17.9%
	Rent	20	30.3%	54	71.05%	76	52.11%	82.1%
Children residing in household?	Yes	10	15.15%	4	5.33%	14	9.93%	8.7%
	No	56	84.85%	71	94.67%	127	90.07%	91.3%
Annual Household Income	Under $24,999	6	10.34%	3	4.48%	9	7.2%	48.3%
	$25,000 – 44,999	9	15.52%	8	11.94%	17	13.6%	23.5%
	$45,000 – 74,999	17	29.31%	20	29.85%	37	29.6%	14.8%
	$75,000 – 99,999	5	8.62%	9	13.43%	14	11.2%	6.9%
	$100,000 – 249,999	16	27.59%	24	35.82%	40	32.0%	5.1%
	Over $250,000	5	8.62%	3	4.48%	8	6.4%	1.4%
How long at current development or neighborhood	6 months or less	3	4.48%	16	21.05%	19	13.29%	Avg. Length of Residence:
	7 months to 1 year	3	4.48%	9	11.84%	12	8.39%	
	1 year to 3 years	34	50.75%	41	53.95%	75	52.45%	
	4 to 10 years	14	20.90%	9	11.84%	23	16.08%	Little Rock/North Little
	Over 10 years	13	19.40%	1	1.32%	14	9.79%	Rock – 6.2 yrs
								Memphis – 5 yrs

Table 4.2. Site Specific Chi-Square Test Results.

	Memphis	Little Rock/North Little Rock	Total
Survey Responses	76	67	143
Non-responses	170	189	359
Total	246	256	502
Contingency Table – Expected results			
Survey Responses	70.1	72.9	
Non-responses	176	183	

Chi Square = 1.37
Degrees of Freedom = 1
Probability = 0.241 (*p-value*)
P-Value of 0.241≥ .05 (Does not reject the null hypothesis that the response rates are independent of the study sites.)

Table 4.3. Chi-Square Test for Population.

	Memphis	Little Rock/North Little Rock	Total
Survey Responses	76	67	143
Subjects not selected for survey and non–responses to survey	2861	711	3572
Total	2937	778	3715

Chi Square = 60.3
Degrees of Freedom = 1
Probability = 0.000 (*p-value*)
P-Value of 0.000≤ .05 (Reject the null hypothesis that the response rates are independent of the study sites.)

The survey responses revealed similarity for several of the key demographic categories of the two study sites. In both study sites, the overwhelming majority of the respondents were household heads without children. The average household incomes within both study sites also indicated similar characteristics with 44.83% of the Little Rock/North Little Rock respondents and 43.2% of the Memphis respondents earning between $25,000 and $75,000 annually.

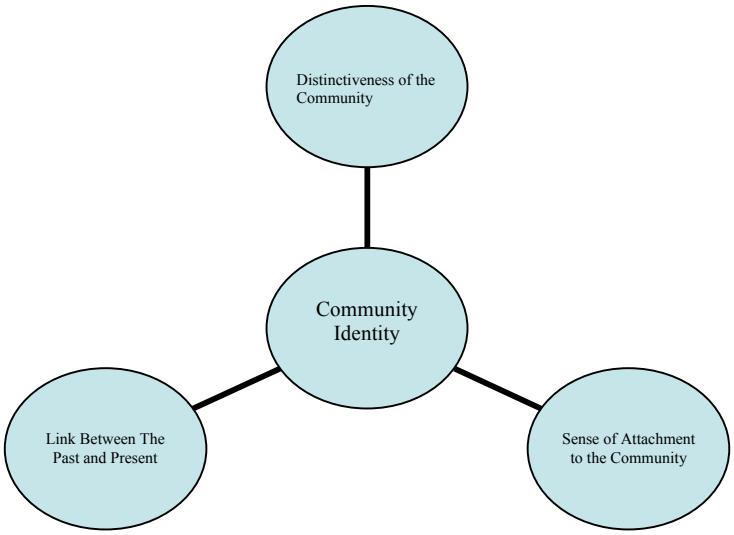
In contrast to the similarity of household and income demographic categories, there were notable differences between the ages of the respondents between the two study sites. Memphis respondents were younger with 91.4% of the respondents being less than 50 years of age while 49.2% of the respondents from Little Rock/North Little Rock were less than 50 years of age. Likewise, the length of time at the current residence was shorter in Memphis with almost one third (32.89%) of the respondents having been at their current residence less than one year as compared to only 9% of the Little Rock/North Little Rock respondents. The length of residency is meaningful as residents become increasingly familiar with their neighborhood over time and develop a bond with the residential environment (Hashas, 2004). This is also related to Little Rock/North Little Rock's higher percentage (69.7% vs. 28.95%) of owner occupied units. These differences can be largely attributed to the inclusion of the well-established Argenta Historic District in the Little Rock/North Little Rock study site whereas the Memphis study site included Central Station Apartments which has a higher percentage of young tenants and typical lease terms of one year or less.

Another important consideration of the two study sites was the similarity of the physical characteristics of the streetcar systems and the adjacent streetcar-oriented developments. In addition to the use of heritage (vintage and replica) streetcars in both of the study sites, the accessibility, fares and schedules were similar. Both study sites have streetcar routes that circulate through the central business districts including areas that have experienced significant residential development activity within recent years (Figures 3.3 and 3.11). Although the research strategy was not a causal comparative analysis of the two study sites, it was insightful to examine the research data in each study site in addition to an analysis of the overall sample. These findings are detailed within the following sections under the theoretical dimensions of *community identity* and *social interaction*. Additional sections are also included on the research findings related to travel behavior and the likes or dislikes of the physical characteristics of the streetcars.

Community Identity

The theoretical dimension of community identity was addressed with four indicators: (1) distinctiveness, (2) sense of pride, (3) current attachment and (4) attachment to the past (see Table 4.4). Four questions in the survey were specifically worded to examine whether streetcars generated enhanced feelings of neighborhood attachment and pride while an additional question addressed attachment to the past with the streetcar. The questions provided a five-point, Likert Scale response framework (1 = Strongly Disagree to 5 = Strongly Agree) whereby the respondents were asked for their level of agreement or disagreement to a particular statement.

Table 4.4. Community Identity and Related Indicators.



Distinctiveness

As detailed in Table 4.5, respondents gave the highest rating to the questions addressing distinctiveness. Question 9b specifically addressed whether streetcars made their "neighborhood more distinctive than other neighborhoods" while question 9c inquired whether the unique aspects of the streetcar enabled respondents to view the streetcar as a distinctive symbol of the neighborhood. Survey responses for both questions evidenced the significance that residents placed upon the streetcars as a contributing factor to their sense of community identity.

An analysis of the survey data by study site indicated slightly higher ratings for the indicator of distinctiveness in Memphis and North Little Rock than in Little Rock. Many of the Memphis and North Little Rock streetcar-oriented developments or neighborhoods were historic properties, which may have influenced respondents'

Table 4.5. Indicator of Distinctiveness (Overall Sample).

	Question	Mean*	N	Sample Proportions that "Agree" and "Strongly Agree"	Confidence Interval for Population
9b	***Streetcars make my neighborhood more distinctive than other neighborhoods***	**4.47**	**142**	**93%**	**93% ± 4**
				(35% "Agree" and 58% "Strongly Agree")	
	t - critical:	**1.6449**			
	t - statistic:	**23.3561**			
	t-test conclusion:	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3 (Ha: $M > 3$).**			
9c	***Streetcars are a symbol of my neighborhood***	**4.15**	**143**	**82%**	**82% ± 6**
				(41% "Agree" and 41% "Strongly Agree")	
	t - critical:	**1.6449**			
	t - statistic:	**15.4423**			
	t-test conclusion:	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3 (Ha: $M > 3$).**			

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

attitudes towards the streetcar's distinctiveness. In Memphis and North Little Rock, the streetcar route passes through several historic districts where many of the respondents reside. The sense of attachment to the past indicator also revealed similar results for the study sites as detailed later in this chapter.

Sense of Pride

The sequencing of the question related to sense of pride was integrated into the design of the survey to explore whether the feelings of neighborhood distinctiveness from streetcars were expressed through a sense of neighborhood pride. Residents were asked whether streetcars conveyed a sense of pride associated with their streetcar-oriented neighborhood. The responses generated fairly high ratings for the overall sample and the two study sites as detailed in Tables 4.6 and 4.7. This is consistent with the aforementioned survey results regarding distinctiveness and provides convincing evidence of the streetcars' contribution to the respondents' image of the unique character of their neighborhood.

Within the individual study sites, the strong neighborhood cohesion of the Argenta Historic District in North Little Rock may have contributed to these respondents providing a higher ranking to the sense of pride factors than the Little Rock and Memphis study sites (see Table 4.8). The follow-up interviews that are summarized later in this chapter confirmed strong feelings of neighborhood pride as a result of the unique identity of the streetcar and the evolution of Argenta as an early streetcar suburb of North Little Rock.. Accordingly, most of the respondents participating in the follow-up interviews expressed great satisfaction with the reintroduction of streetcar service as a tangible link to the neighborhood's history.

Table 4.6. Indicator of Distinctiveness by Study Site.

	Question	Memphis Mean*	North Little Rock Mean*	Little Rock Mean*
9b	***Streetcars make my neighborhood more distinctive than other neighborhoods***	**4.53**	**4.64**	**4.04**
	t - critical:	**1.6652**	**1.6860**	**1.7056**
	t - statistic:	**25.4419**	**17.5277**	**4.4143**
	t-test conclusion:	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3 (Ha: $M > 3$).**	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3 (Ha: $M > 3$).**	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3 (Ha: $M > 3$).**
9c	***Streetcars are a symbol of my neighborhood***	**4.30**	**4.08**	**3.85**
	t - critical:	**1.6652**	**1.6849**	**1.7056**
	t - statistic:	**14.3347**	**7.6894**	**5.0837**
	t-test conclusion:	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

Table 4.7. Indicator of Sense of Pride (Overall Sample).

	Question	Mean*	N	Sample Proportions that "Agree" and "Strongly Agree"	Confidence Interval for Population
9d	***Streetcars convey a sense of pride in my neighborhood***	**3.73**	**142**	**60.5%**	**60.5% $\pm$ 8**
	t - critical:	**1.6449**		**(37.3% "Agree" and 23.2% "Strongly Agree")**	
	t - statistic:	**9.0492**			
	t-test conclusion:	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**			

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

Table 4.8. Indicator of Sense of Pride by Study Site.

	Question	Memphis Mean*	North Little Rock Mean*	Little Rock Mean*
9d	***Streetcars convey a sense of pride in my neighborhood***	**3.61**	**4.03**	**3.63**
	t - critical:	**1.6652**	**1.6860**	**1.7056**
	t - statistic:	**5.7310**	**6.9894**	**3.3863**
	t-test conclusion:	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

Current Attachment

The question of current neighborhood attachment was designed to explore whether residents in streetcar-oriented neighborhoods felt a greater sense of attachment than their previous, non-streetcar residence. If the respondents had previously lived in another streetcar-oriented neighborhood, these responses were excluded from the data analysis related this question. Consistent with the above-referenced indicators (distinctiveness and sense of pride), current neighborhood attachment also received high ratings within the overall sample with a mean ranking of 3.92 (Table 4.9). The feelings of current attachment were more pronounced with North Little Rock respondents based on their mean ranking of 4.6 (Table 4.10). The Argenta Historic District's Property Owner's Association and Main Street Argenta (see Figure 4.1) have promoted a strong sense of neighborhood solidarity among residents. As discussed later in this chapter, follow-up interviews with North Little Rock respondents expressed higher levels of

Table 4.9. Indicator of Current Neighborhood Attachment (Overall Sample).

	Question	Mean*	N	Sample Proportions that "Agree" and "Strongly Agree"	Confidence Interval for Population
9a	***I feel more attached to my current neighborhood than where I previously lived***	**3.92**	**138**	**67.4%**	**67.4% ± 8**
				(27.4% "Agree" and 40% "Strongly Agree")	
	t - critical:	**1.645**			
	t - statistic:	**9.6981**			
	t-test conclusion:	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**			

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

Table 4.10. Indicator of Current Neighborhood Attachment by Study Site.

	Question	Memphis Mean*	North Little Rock Mean*	Little Rock Mean*
9a	***I feel more attached to my current neighborhood than where I previously lived***	**3.731**	**4.6**	**3.42**
	t - critical:	**1.6663**	**1.6849**	**1.7081**
	t - statistic:	**5.4514**	**15.0629**	**1.9439**
	t-test conclusion:	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

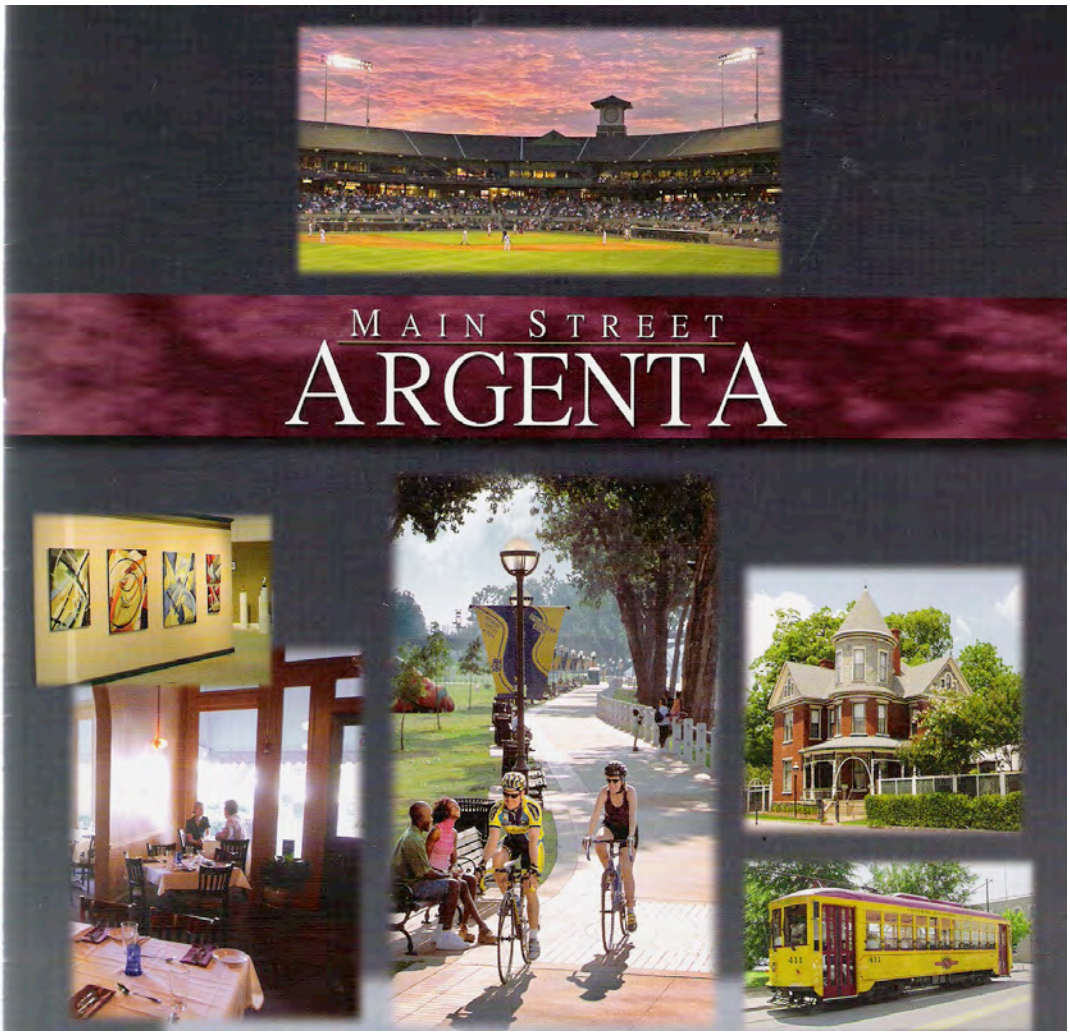


Figure 4.1. Main Street Argenta Promotional Brochure (Brochure courtesy of Main Street Argenta, North Little Rock, Arkansas).

satisfaction with their neighborhood and the contribution of the streetcar to its revitalization.

Attachment to the Past

The streetcar played a significant role in the local history and evolution of all of the study sites. Accordingly, the survey included a question within the theoretical dimension of community identity to explore the importance of the streetcars as a tangible link to the past for the residents of the streetcar-oriented developments and neighborhoods. As shown in Tables 4.11 and 4.12, favorable rankings were received in all of the study sites with an overall mean of 3.73.

A breakdown of the survey results by study site revealed higher mean ratings in Memphis and North Little Rock with the attachment to the past indicator. The follow-up interviews confirmed that residents in these communities had a greater awareness of the historic character of their surroundings and the contextual contribution of the streetcar to the historic environment of the immediate neighborhood. The historic district designation of Argenta in North Little Rock and the numerous historic, adaptive-use properties within the Memphis study site may have contributed to a greater awareness of the role of the streetcar as an integral part of the historic character in those neighborhoods and ultimately promoted a heightened sense of attachment to the past within these study sites.

Table 4.11. Indicator of Attachment to the Past (Overall Sample).

	Question	Mean*	N	Sample Proportions that "Agree" and "Strongly Agree"	Confidence Interval for Population
9e	***Streetcars connect me with the history of my community***	**3.73**	**143**	**65.1%**	**65.1% ± 8**
				(39.2% "Agree" and 25.9% "Strongly Agree"	
	t - critical:	**1.6449**			
	t - statistic:	**8.0161**			
	t-test conclusion:	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**			

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

Table 4.12. Indicator of Attachment to the Past by Study Site.

	Question	Memphis Mean*	North Little Rock Mean*	Little Rock Mean*
9e	***Streetcars connect me with the history of my community***	**3.69**	**3.95**	**3.48**
	t - critical:	**1.6652**	**1.6849**	**1.7056**
	t - statistic:	**5.6114**	**5.9430**	**2.0977**
	t-test conclusion:	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**	**Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

Residents' values derived from the overall sample of the survey results of the four indicators within the theoretical dimension of community identity are summarized below in Table 4.13. Evidence from the survey results revealed a general feeling among the respondents that the streetcars created a unique sense of character for their neighborhoods that engendered heightened feelings of distinctiveness, pride and attachment (current and past). Although the contribution of heritage streetcars towards enhanced feelings of community identity is but one of several factors that may have influenced respondents attitudes, the streetcars were recognized as a unique and widely accepted symbol for the sample sites.

Table 4.13. Survey Results of Community Identity with Streetcars.

Theoretical Dimension of Community Identity

	Importance (mean)				
Indicator - Distinctiveness (mean = 4.47)	5	4	3	2	1
"Streetcars make my neighborhood more distinctive than other neighborhoods"					
"Streetcars are a symbol of my neighborhood" (mean = 4.15)					
Indicator - Sense of Pride (mean = 3.73)					
"Streetcars convey a sense of pride in my neighborhood"					
Indicator - Current Neighborhood Attachment (mean = 3.92)					
"I feel more attached to my current neighborhood than where I previously lived"					
Indicator - Attachment to the Past (mean = 3.73)					
"Streetcars connect me with the history of my community"					

*1 = Strongly Disagree
2 = Disagree
3 = Neither Agree or Disagree
4 = Agree
5 = Strongly Agree

Interview Results Regarding Streetcars and Enhanced Community Identity

Follow-up interviews were conducted as the qualitative phase of the methodology to gain additional insight and support the quantitative survey data. In addition to respondent follow-up interviews, prominent real estate professionals, transit management personnel and planners were interviewed. The open-ended interviews included questions that provided an opportunity to gain an additional perspective of the role of streetcars within the theoretical dimension of community identity.

The results of the interviews with real estate professionals convincingly uncovered feelings of enhanced community identity consistent with the survey responses from the residents in streetcar-oriented developments. One developer stated "…there is an identity with the streetcar and it's iconic…" Another developer offered similar comments with "…clearly, it creates an identity and is an attractive part of the streetscape…" This developer also added an insightful view that streetcars engendered a form of identity with an increased sense of security "…by not letting people feel alone…" with a "…sense of well-being even as you are walking on the street as the streetcar passes..." Another real estate professional discussed how residents in his development also identified with the added sense of security when "…walking or running and knowing that the streetcar will be coming by on a regular basis..."

Follow-up interviews with respondents also revealed this unique perspective of an identity with streetcars as a means of increased security. As one Memphis respondent noted: "…the streetcars give me a sense of security…. it (the streetcar) goes by on a regular schedule and I feel safer knowing that it goes by..." A North Little Rock resident

expressed a similar view with "I love the streetcar….. it is a comfortable feeling as it makes the neighborhood stable and secure..."

The identity of the streetcar and the promotion of its image in marketing material (see Figure 4.2) were also explored in the interviews with the real estate professionals. According to the interview participants, streetcars offered a distinct marketing advantage with explanations such as "…they (streetcars) are like a logo…" and "…used extensively in our advertising…" Recognizing that the streetcars "…are definitely part of the brand and logo of downtown…" all of the developers promoted streetcar accessibility with their developments on their web sites, brochures or in their advertising. One developer enthusiastically explained that the identity with the streetcar was such that "…you do not need to use an address because of the streetcar route…" in the marketing material.

Transit officials and planners offered an additional yet complementary perspective of the streetcar as a symbol fostering community identity. One interview that addressed streetcars and the indicator of attachment to the past prompted a transit executive director to comment that streetcars "…evoke a sense of nostalgia…" that was more pronounced among certain demographic households with "…older adults and families with children appreciate the streetcar more..." In Little Rock, a planning and development director pointed out that the community identity of the streetcar "…effectively bridges North Little Rock and Little Rock…"—two municipalities separated by the Arkansas River which was previously considered a barrier between the two cities. The Central Arkansas Transit System streetcar provides streetcar service to both cities with the River Rail route crossing the river with a separate lane exclusively for

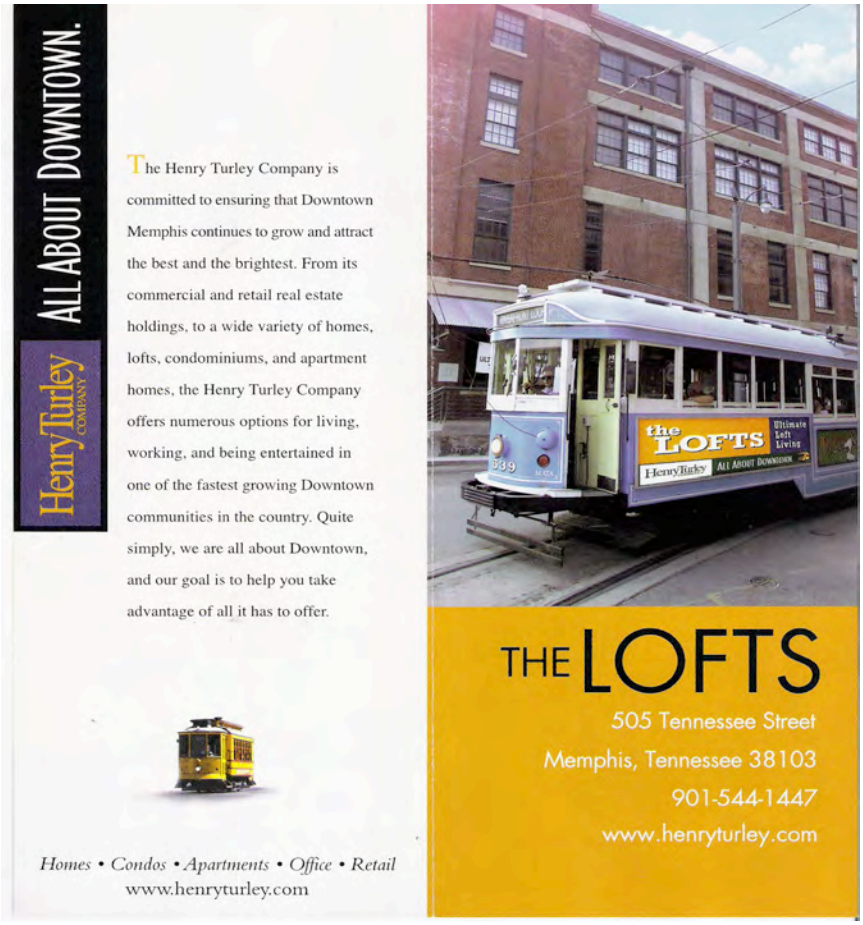


Figure 4.2. The Lofts Marketing Brochure (Brochure courtesy of the Henry Turley Company, Memphis, Tennessee).

the streetcar which has "…reintroduced North Little Rock to many people…. and reinforcing the benefits of the river..."

In Memphis, one planner noted that the streetcar has become a symbol of community identity equal to the Pyramid and the Mississippi River Bridge into the city, two icons of the Memphis skyline. He also pointed out that ESPN featured the streetcar in opening segments of recent basketball games televised from Memphis. Similarly, a Memphis transit planning manager pointed out that the evening news for one television

network opens the broadcast each night with a taped view of the Main Street streetcar along with other images of Memphis. Commenting that "…everything downtown has the streetcar logo on it…", the Memphis transit planning manager noted that a number of advertising publications use photographs of the streetcar as a means of promoting a distinctive identity of the downtown community.

Streetcars as an Amenity

Another related perspective of the streetcar and community identity was explored with a question to respondents whether they considered the streetcar to be an amenity to their place of residence. Residents in streetcar-oriented developments and neighborhoods overwhelming (85%) responded affirmatively to this question. This was consistent within all study sites with ranges of 83% to 86% of the respondents in Memphis and Little Rock/North Little Rock responding affirmatively. This was also reinforced during the follow-up interviews whereas the respondents consistently expressed views of the streetcar as a unique amenity that enhanced social outings such as restaurant and shopping excursions. The follow-up interviews addressed the respondents' perceptions of the streetcar as an amenity with an open-ended question that provided a wide range of views on this subject. Responses such as: "…it is an asset to the neighborhood…", "I think it's a wonderful amenity…" and "…it's definitely an amenity that brings variety to the community…" were typical views expressed by the respondents. Some interview participants considered the streetcar to be an amenity that influenced some residents' decision to buy or rent within their neighborhood or development. Comments such as "…people buy at The Lofts (Memphis) because they see the streetcar as an amenity…",

"I think it is an amenity…. and it did have some influence upon our decision to live where we do…." and "…it (the streetcar) definitely adds value to my property…" were some of the views expressed during the interviews by residents.

A similar interview question was asked of real estate professionals to gain their perspective of streetcars as an amenity to the residents in their streetcar-oriented developments. All of the real estate professionals offered views that considered the streetcar to be an amenity that provided varying benefits. One property manager compared the streetcar to other amenities such as a pool or roof deck stating "…the streetcar is another perk…" while a Memphis developer noted that "…it (the streetcar) is definitely an amenity… it's first on the list and it's the first lead-in item we use with prospective buyers..." Another Memphis developer expressed a similar view with "…you can compare it to a roof deck. A prospective renter thinks he or she will use it a lot more than they really do after moving in…" A Little Rock developer discussed the streetcar as a perceived amenity as compared to actual resident usage and offered an opinion that "I believe it's perceived more as an amenity when buying decisions are made but it practice, I think usage will improve over time….. we need to promote it more and how it can be used…" Other real estate professionals also discussed how they market the streetcar as an amenity and the perception of anticipated usage as compared to actual usage by the residents. A Memphis real estate broker and investor stated "…the streetcar is definitely an amenity when I'm selling the condominiums. We advertise it as an amenity…. we use 'On the trolley line' in our marketing…" while another Memphis developer offered a perspective of the streetcar as an amenity that makes primarily a

contextual contribution to the streetscape with the opinion that "…it's only an amenity if it helps the neighborhood. It's more like public art – you see it and enjoy looking at it..."

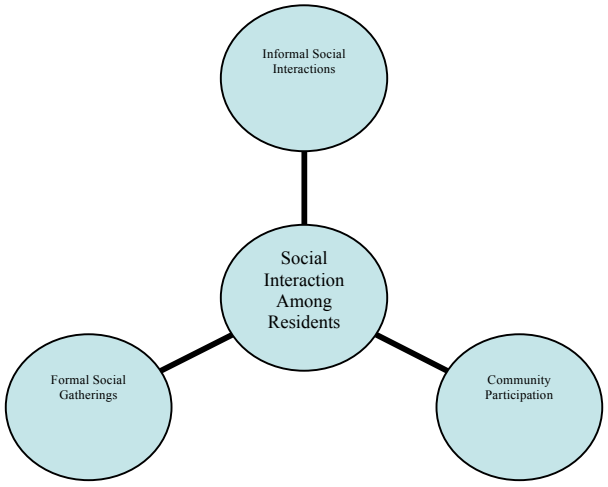
In summary, enhanced feelings of community identity were evident with the four indicators within the survey and during follow-up interviews. Accordingly, the research findings revealed an enhanced sense of community identity among residents in streetcar-oriented developments and neighborhoods within the study sites. Evidence from the study also strongly indicated that streetcars were perceived as a unique amenity that fosters feelings of a distinctive community setting among the residents.

Social Interaction

The theoretical dimension of social interaction was included in the survey research with questions under three indicators: (1) informal interactions, (2) formal interactions and (3) community participation (see Table 4.14). The survey questions specifically addressed activities that residents in streetcar-oriented developments might engage in while riding or waiting for the streetcar. Within the context of this study, neighbors were defined as residents that resided within the same development or within the same neighborhood as distinguished by the name of the neighborhood or in the absence of a name, that area within a ten-minute walk as set forth in Chapter III.

While residents in the study sites responded favorably to the dimension of community identity related to the streetcars, social interaction resulting from streetcar activities received low ratings among all three indicators. It is noteworthy that only the survey question that specifically addressed neighborhood friendliness received favorable ratings among all of the questions related to social interaction activities. Respondents

Table 4.14. Social Interaction and Related Indicators.



were asked if they considered people in their neighborhood to be "friendlier than where I previously lived". The mean rating of 3.6 (Likert Scale of 1 to 5) reflected a moderate level of agreement.

A question designed to explore a willingness to use streetcars over other means of travel due to "socializing with other people" reflected ambivalence with a mean rating of 3.17 (3 = neither agree nor disagree). This seemed to capture the essential quality of the social interaction dimension whereas the respondents identify with the streetcar and generally are pleased with its contribution to the community but inconsistent ridership diminishes the social benefits associated with its use.

Informal Interactions

Four questions related to unplanned activities resulting from spontaneous actions between neighbors were included in the survey. All of these questions provided response

categories based upon the frequency of the activities within the past thirty days with the results detailed in Table 4.15.

The scores for informal interactions indicated low levels of activity for this indicator with only slight differences between the mean ratings for the study sites. The t-test conclusions for each of the study site results provided no statistical evidence for the population's mean rating to exceed a mean rating (neutral) of 3. As detailed in Table 4.16, the level of informal activity in all study sites indicated infrequent encounters with neighbors while riding or waiting for a streetcar.

Formal Interactions

As an indicator for social interaction, formal interactions related to streetcar activity received unfavorable scores with two questions. Designed to explore whether residents made social plans while riding the streetcar, these questions revealed negligible occurrences of this indicator of social interaction (Table 4.17).

An analysis of the survey results for formal interactions by study site revealed no substantive differences. In all three cities, residents rarely made plans with either known or unknown neighbors while riding on a streetcar although Memphis respondents scored slightly higher with a mean of 1.21 (Table 4.18).

The likelihood that previously made plans resulted in neighbors riding together was explored with a follow-up question asking the respondent "who did you ride on the streetcar with" to a specified event. As shown in Table 4.19, although the majority of the respondents indicated friends and family as their most recent riding companions, it is

Table 4.15. Indicator of Informal Interactions (Overall Sample).

	Question: Within the past 30 days how often have you participated in the following activities?	Mean*	N	Sample Proportions of "None" and "1 to 3 times"	Confidence Interval for Population
10c	*Talked with a neighbor I already knew while walking or waiting for a streetcar* **t - critical:** **t – statistic:** **T – test conclusion:**	1.60 **1.6449** **-18.4723** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	129	86.8% (56.6% "None" and 30.2% "1 to 3 times")	86.8% $\pm$ 5
10d	*Talked with a neighbor I already knew while riding on a streetcar* **t - critical:** **t – statistic:** **T – test conclusion:**	1.35 **1.6449** **-26.5352** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	131	93.1% (74.8% "None" and 18.3% "1 to 3 times")	93.1% $\pm$ 4
10f	*Talked with someone <u>I didn't know</u> from my neighborhood while walking to or waiting for a streetcar* **t - critical:** **t – statistic:** **T – test conclusion:**	1.64 **1.6449** **-21.8688** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	133	87.2% (54.1% "None" and 33.1% "1 to 3 times")	87.2% $\pm$ 5

Table 4.15. Indicator of Informal Interactions (Overall Sample) (continued).

	Question: Within the past 30 days how often have you participated in the following activities?	Mean*	N	Sample Proportions of "None" and "1 to 3 times"	Confidence Interval for Population
10g	*Talked with someone I didn't know from my neighborhood while riding on a streetcar*	1.56	130	86.2% (58.5% "None" and 27.7% "1 to 3 times")	86.2% ± 6
	t - critical: **t – statistic:** **T – test conclusion:**	**1.6449** **-20.1084** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**			

*1 = None, 2 = 1 to 3 times, 3 = 4 to 10 times, 4 = 11 to 25 times,5 = More than 25 times

Table 4.16. Indicator of Informal Interactions by Study Site.

	Question: Within the past 30 days how often have you participated in the following activities?	Memphis Mean*	North Little Rock Mean*	Little Rock Mean*
10c	*Talked with a neighbor I already knew while walking or waiting for a streetcar*	**1.67**	**1.52**	**1.48**
	t - critical: **t – statistic:** **T – test conclusion:**	**1.6663** **-12.8721** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**1.6924** **-9.6358** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**1.7171** **-9.9790** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**

Table 4.16. Indicator of Informal Interactions by Study Site (continued).

	Question: Within the past 30 days how often have you participated in the following activities?	Memphis Mean*	North Little Rock Mean*	Little Rock Mean*
10d	*Talked with a neighbor I already knew while riding on a streetcar*	**1.41**	**1.31**	**1.21**
	t - critical:	**1.6663**	**1.6909**	**1.7139**
	t – statistic:	**-17.4435**	**-14.7880**	**-17.2282**
	T – test conclusion:	**Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**
10f	*Talked with someone <u>I didn't know</u> from my neighborhood while walking to or waiting for a streetcar*	**1.74**	**1.5**	**1.52**
	t - critical:	**1.6660**	**1.6896**	**1.7171**
	t – statistic:	**-12.1472**	**-11.1029**	**-9.7164**
	T – test conclusion:	**Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**
10g	*Talked with someone <u>I didn't know</u> from my neighborhood while riding on a streetcar*	**1.70**	**1.43**	**1.30**
	t - critical:	**1.6663**	**1.6909**	**1.7171**
	t – statistic:	**-12.4437**	**-13.305**	**-12.8392**
	T – test conclusion:	**Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**

*1 = None, 2 = 1 to 3 times, 3 = 4 to 10 times, 4 = 11 to 25 times,5 = More than 25 times

Table 4.17. Indicator of Formal Interactions (Overall Sample).

	Question: Within the past 30 days how often have you participated in the following activities?	Mean*	N	Sample Proportions of "None" and "1 to 3 times"	Confidence Interval for Population
10e	*Made specific plans to meet later with a neighbor I already knew while riding on a streetcar.* **t - critical:** **t – statistic:** **T – test conclusion:**	1.14 **1.6449** **-48.9498** **Do not reject Ho: *M*≤3 No statistical evidence for pop. *M* exceeding 3**	128	96.9% (89.1% "None" and 7.8% " 1 to 3 times")	96.9% ± 2.9
10h	*Made specific plans to meet later with someone I didn't know from my neighborhood while riding on a streetcar* **t - critical:** **t – statistic:** **T – test conclusion:**	1.06 **1.6449** **-92.3640** **Do not reject Ho: *M*≤3 No statistical evidence for pop. *M* exceeding 3**	131	99% (92.9% "None" and 6.1% "1 to 3 times")	99% ± 1.67

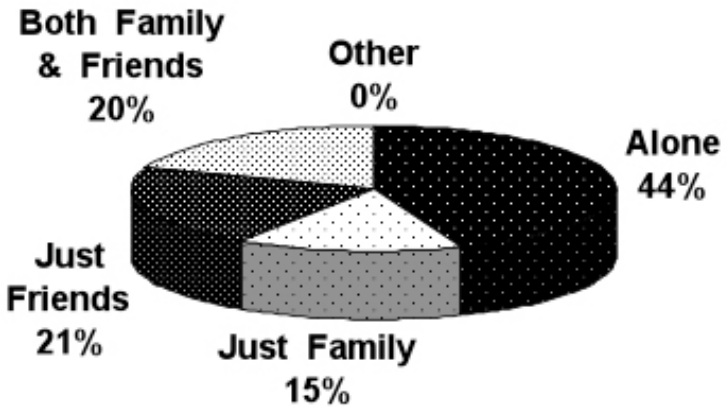
*1 = None, 2 = 1 to 3 times, 3 = 4 to 10 times, 4 = 11 to 25 times,5 = More than 25 times

Table 4.18. Indicator of Formal Interactions Indicator by Study Site.

	Question: Within the past 30 days how often have you participated in the following activities?	Memphis Mean*	North Little Rock Mean*	Little Rock Mean*
10e	*Made specific plans to meet later with a neighbor <u>I already knew</u> while riding on a streetcar.*	**1.21** **1.6666** **-12.4437** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**1.06** **1.6939** **-45.994** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**1.04** **1.7139** **-47.046** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**
	t - critical: **t – statistic:** **T – test conclusion:**			
10h	*Made specific plans to meet later with someone <u>I didn't know</u> from my neighborhood while riding on a streetcar*	**1.07** **1.6663** **-64.8444** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**1.09** **1.6663** **-39.7877** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**1** **1.7139** **-97.9796** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**
	t - critical: **t – statistic:** **T – test conclusion:**			

*1 = None, 2 = 1 to 3 times, 3 = 4 to 10 times, 4 = 11 to 25 times,5 = More than 25 times

Table 4.19. Distribution of Streetcar Riding Companions.



significant that 44% of the respondents rode alone to the specified events. The follow-up interviews did reveal that a number of respondents would make plans to meet friends and family at their chosen destination with the parties arriving separately and on different modes of transit.

Community Participation

As a social activity, community participation is an organized activity that provides an opportunity in which residents can socially interact in a variety of settings. The survey instrument included six questions that addressed current neighborhood involvement, participation in volunteer activities and social organizations and the frequency in which neighbors were encountered in such settings. The basis of comparison was the respondent's current neighborhood compared to their previous, non-streetcar neighborhood. Responses from residents who previously lived in streetcar neighborhoods were not included in the data analysis for this component of the research. Community participation received the highest ratings of the social interaction categories as shown in Table 4.20. It is significant that North Little Rock respondents were significantly more involved in their current neighborhood association or homeowners' association ("property association") than where they previously lived with a mean rating of 4.43 (Table 4.21). This was reinforced with 82 % of the North Little Rock respondents indicating they currently belonged to a property association as compared to 44.4 % in Little Rock and 39% in Memphis. Although North Little Rock respondents had a higher percentage of home ownership (82%) as compared to Memphis (39%) and Little Rock (52%), it is meaningful that 87.2% of the North Little Rock respondents did

Table 4.20. Indicator of Community Participation (Overall Sample).

	Question	N	Mean*
9f	*I am more involved in my neighborhood association or homeowners association than where I previously lived.*	129	3.42 **t - critical: 1.6652** **t – statistic: 5.6114** **Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

Table 4.21. Indicator of Community Participation by Study Site.

	Question	Memphis Mean*	North Little Rock Mean*	Little Rock Mean*
9f	*I am more involved in my neighborhood association or homeowners association than where I previously lived.*	3.01	4.43	2.96
	t - critical: **t – statistic:** **T – test conclusion:**	**1.6683** **1.052** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**	**1.6883** **10.8634** **Reject Ho: $M \leq 3$ Statistical evidence for pop. *M* exceeding 3**	**1.7081** **.1677** **Do not reject Ho: $M \leq 3$ No statistical evidence for pop. *M* exceeding 3**

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

not belong to a property association where they previously lived. Likewise 59.3% and 77.3% of the Little Rock and Memphis respondents respectively did not belong to a property association at their previous residence. The decline in percentages of Little Rock and Memphis for current non-involvement compared to previous address non-involvement indicates more active participation in these study sites as well.

The questions that focused upon the types of social organizations and volunteer activities were designed to measure whether the residents had participated in these activities since moving to their current, streetcar-oriented neighborhood but had not done so at their previous, non-streetcar neighborhood. As shown in Table 4.22, the respondents in the study sites participated in a wide range of activities.

Although community participation may not have been the primary type of social interaction for residents in the study sites, the setting and form of the community participation provided an opportunity for residents to engage in neighboring behavior. Accordingly, one question of the survey asked the respondents how often they encountered a neighbor at the above-referenced social or volunteer activities within the past thirty days. The overall sample mean rating was 1.53 with "1" being one to three times and 2 being four to ten occurrences with additional response categories for higher frequencies of encounters (see Table 4.23).

Table 4.22. Social Organization and Volunteer Activities Since Moving To Streetcar-Oriented Neighborhood (Not Previously Involved In).

Category	Responses (n = 140)
Neighborhood-based volunteer activity	25% (of respondents)
Walking, running, biking, or fitness club	23.57%
Civic-related volunteer activity	22.14%
Performing arts organization	14.29%
Historic organization	10.71%
Church	7.86%
Museum	7.14%
Environmental organization	6.43%
Dining or wine tasting organization	5%
Parent Teacher Association (PTA)	4.29%
Youth sports-related volunteer activity	3.57%

Table 4.22. Social organization and volunteer activities Since Moving To Streetcar-Oriented Neighborhood (Not Previously Involved In) (continued).

Category	Responses (n = 140)
Church-related volunteer activity	2.86%
Country club	2.14%
Other school volunteer activity	1.43%
Other	8.57%

Table 4.23. Encounters with Neighbors at Social Organizations or Volunteer Activities.

	Question	Mean (Likert Scale 1 – 5)*	N	Sample Proportions of "None" and "1 to 3 times"	Confidence Interval for Population
12c	*How many times did you encounter a neighbor at a function of the organizations/activities you checked above within the past 30 days?*	1.53	132	75.8% (47.8% "None" and 28% "1 to 3 times")	75.8% ± 7
	t - critical: **t – statistic:** **T – test conclusion:**	**1.6449** **-17.7219** **Do not reject Ho: $M \leq 3$** **No statistical evidence for pop. *M* exceeding 3**			

*1 = None, 2 = 1 to 3 times, 3 = 4 to 10 times, 4 = 11 to 25 times,5 = More than 25 times

North Little Rock respondents encountered neighbors at a higher frequency than the Memphis and Little Rock respondents as shown in Table 4.24. T-tests were performed comparing the encounter rates between North Little Rock and the other study sites. The t-tests provided statistical evidence for the differences between North Little Rock and the other two study sites for this category. The survey results for the encounter

Table 4.24. Encounters with Neighbors at Social Organizations or Volunteer Activities by Study Site.

	Question	Memphis Mean*	North Little Rock Mean*	Little Rock Mean*
12c	*How many times did you encounter a neighbor at a function of the organizations/activities you checked above within the past 30 days?*	.63	1.31	.58
	t - critical: **t – statistic:** **T – test conclusion:**	**1.6679** **-22.667** **Do not reject Ho: *M*≤3 No statistical evidence for pop. *M* exceeding 3**	**1.6860** **-10.797** **Do not reject Ho: *M*≤3 No statistical evidence for pop. *M* exceeding 3**	**1.7081** **-13.6788** **Do not reject Ho: *M*≤3 No statistical evidence for pop. *M* exceeding 3**

*0 = None, 1 = 1 – 3 times, 2 = 4 – 10 times, 3 = 11 – 25 times, 4 = More than 25 times

rates at social organizations were consistent with other social interaction responses and indicative of the cohesiveness of the Argenta neighborhood.

Interview Results Regarding Streetcars and Social Interaction

The follow-up interviews also addressed social interaction with open-ended questions that provided an opportunity for survey respondents, real estate professionals, planners and transit officials to share their perspective. A recurring theme with the interview participants was the view that streetcars provided an enjoyable mode of travel with friends and family when used for social outings but the opportunities for regular social contact with neighbors were limited due to inconsistent use. As a Memphis property manager stated: "…the streetcar is a means for this (increased social interaction) to happen but it doesn't necessarily happen..." A transit planner compared the streetcar opportunities for social engagement with the bus system and pointed out:

"…the downtown residents seem to have an ownership of the system. They recognize neighbors and interact with them because of the streetcar. However, the bus route seems to have more of this—the same people ride the same bus each day. The streetcar is a diverse transit mode with tourists and residents so that the social interaction is more inconsistent..."

Another transit official lamented the lack of connectivity of the streetcar to more neighborhoods thereby impeding the opportunities for more social interaction. Pointing out that the planning of the streetcar route "…did not give enough thought to promoting neighborhood access and service…", the ability to capture more ridership with nearby residents might have increased the opportunities for regular social interaction. A Little Rock developer offered a more optimistic perspective with a description of the streetcar as "…a focal point for social interaction…" and how "…the streetcar adds to the social gatherings near the stops, especially near the restaurants..." However, another Little Rock developer downplayed the role of the streetcar as a means of promoting social interaction by acknowledging that "…streetcars lead to greater social interaction but it's not of prime importance to the residents..."

Although the research indicates limited social interaction related to regular streetcar activities, the streetcar does play a prominent role with special events such as festivals and gallery tours (see Figure 4.3). In Memphis, the streetcar system has successfully collaborated with local artists and galleries to promote the Friday Night Arts District Trolley Tour. This popular gallery tour is held the last Friday of each month in the South Main Historic District and the streetcar system provides free service to riders

Figure 4.3. Friday Night Arts District Trolley Tour in Memphis (Photograph courtesy of www.southmainbusiness.net).

who can then visit the numerous galleries and artist studios with in the district. During follow-up interviews in Memphis, the Arts District Trolley Tour was mentioned by several real estate professionals and survey respondents as an example of the streetcar's role in facilitating social interaction. Although the event is a monthly event, one real estate professional described the tour as "…very successful with a lot of social interaction..." Another developer credited businesses and developments on the streetcar route for promoting the Arts District Trolley Tour but was critical of the Memphis Area Transit Authority's overall promotion efforts with the statement that "I do not see MATA promoting the trolley system…" while another developer agreed that the "…with the Friday Night Arts District Trolley Tours and game nights (University of Memphis and NBA Grizzlies), streetcars help promote it (social interaction)…"

Respondent follow-up interviews also revealed additional insight regarding the role of the streetcar and social interaction with a consensus that streetcar trips to destinations such as sporting events, farmer's markets, dining with family and friends promoted social interaction. However, most of these trips were limited to weekend outings or coincided with special events such as the aforementioned Friday Night Arts District Trolley Tour in the South Main Historic District of Memphis. One Little Rock respondent observed that "…during baseball season, the streetcar is jammed with folks going to the ball park in North Little Rock…" and how they "…noticed a number of neighbors going to the farmer's market on the streetcar…" A North Little Rock respondent credited the streetcar as one of the reasons she had moved into the neighborhood so that she "…could take the children to the Riverwalk Park, the library, and museums" and how she "…would use the streetcar once a week for such outings..." Other respondents considered the streetcar to be "…a great way to meet neighbors…. and get people more socially involved…" but generally the interview participants cited the waiting time as the primary reason the streetcar was not practical for commuting to work thus limiting the opportunities for increased social interaction on a daily basis.

In sum, evidence from the study indicates that that very little social interaction directly occurred among residents while waiting for or riding the streetcar on a regular basis. Although a popular mode of public transit for special events or trips with family and friends, the limited use of the streetcar as a means of commuting to work on a regular basis by the residents reduced the number of opportunities for social engagement. The travel behavior section of this chapter provides additional research findings that were

consistent with the survey and interview responses addressing the barriers of regular streetcar usage and social interaction.

Travel Behavior

In the eyes of elected officials and city planners, streetcar-oriented developments, like other forms of transit-oriented development, offer modest hope that traffic congestion, energy depletion and air pollution will be reduced while stemming the social disintegration of inner cities (Cervero et al., 2002). As a means to attain these goals, streetcars offer an alternative mode of public transit that enables residents of streetcar-oriented developments to reduce their automobile dependency for nearby destinations. Although the primary goal with the reintroduction of heritage streetcars has been to serve as a catalyst for economic development and increased tourism, a secondary goal has been to provide another commuting option for downtown workers and increase public transit access.

As detailed in this section, evidence from the research indicates two contrasting views of streetcars thereby creating a sense of disconnect between residents' feelings of attachment and symbolism associated with the streetcar but an unwillingness to ride it more often. Survey respondents and interview participants clearly perceive the streetcar to be an enjoyable amenity that enhances the character of their community but they do not view it as an essential mode of transit for personal use. Reasons cited in the study were primarily focused upon perceived feelings of operational inefficiencies or the length of wait for arrival of the streetcar. However, it is noteworthy that only 30% of the respondents indicated their place of employment to be on the streetcar line. This limited

the opportunities for a more regular use of the streetcar as the primary mode of transit for much of the sample and significantly affected the opportunities for increased social interaction among the residents.

In order to measure the awareness of the streetcar system as an anticipated transit option, one survey question focused upon the promotion of the streetcar by their current neighborhood or property manager. As shown in Table 4.25, respondents favorably reacted to whether streetcar accessibility was promoted indicating a general awareness of streetcar accessibility.

Memphis and North Little Rock respondents reacted more favorably than Little Rock respondents to the survey statement regarding the promotion of streetcar accessibility. With mean ratings of 4.19 and 4.13 respectively, Memphis and North Little

Table 4.25. Current Awareness of the Streetcar.

	Question	Mean (Likert Scale 1 – 5)*	N	Sample Proportions that "Agree" and "Strongly Agree"	Confidence Interval for Population
9I	*My neighborhood or development promotes accessibility to the streetcar in its marketing material*	4.04	136	83.1% (50% "Agree" and 33.1% "Strongly Agree")	83.1% ± 6
	t - critical: **t – statistic:** **T – test conclusion:**	**1.6449** **12.6680** **Reject Ho: $M \leq 3$** **Statistical evidence for pop. *M* exceeding 3**			

*1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree

Rock respondents indicated a higher level of satisfaction with how their development or neighborhood made them aware of access to the streetcar as compared to residents in Little Rock with a mean rating of 3.46.

The essential question of recent ridership provided a critical link between the achievements of the streetcar with enhanced community identity and whether it was embraced by respondents with regular ridership thereby fostering opportunities for increased social interaction. Accordingly, a survey question specifically asked participants how often they had ridden a streetcar within the past thirty days. The overall sample results as detailed in Table 4.26, revealed a mean of 1.96 for such ridership which equates to an average of one to three times. Ridership was higher in Memphis with a mean rating of 2.21 as compared to the Little Rock and North Little Rock ratings of 1.59. It is possible that the difference in ridership between the study sites might be partially attributed to shorter headways (10 minutes during the week) in Memphis as compared to Little Rock/North Little Rock (15 to 25 minutes). The effect of the length of wait upon ridership is discussed in more detail in Chapter V.

Table 4.26. Ridership of the Streetcar within the Past 30 Days.

	Question:	N	Mean*	Sample Proportions of "None" and "1 to 3 times"	Confidence Interval for Population
10a	*Within the past 30 days, how often have you participated in the following activities (rode on a streetcar)?*	141	1.96	72.3% (38.3% "None" and 34% "1 to 3 times")	72.3% $\pm$ 7.3

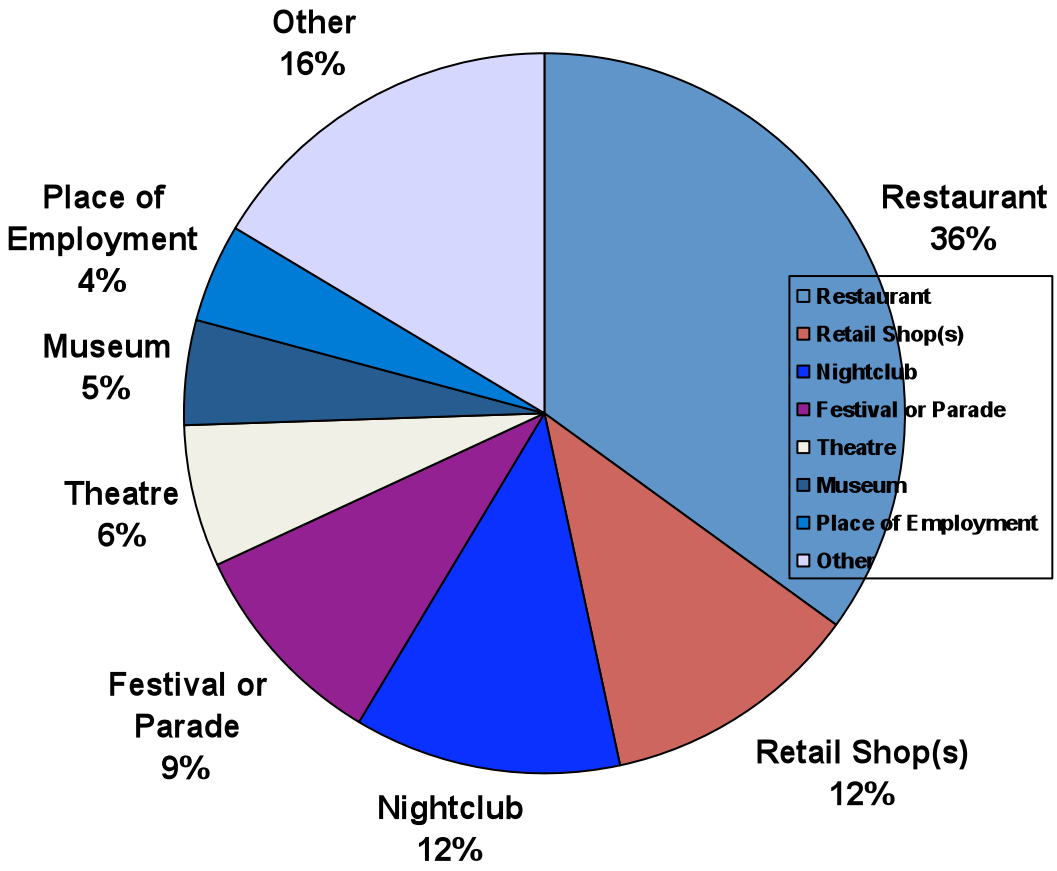
*1 = None, 2 = 1 to 3 times, 3 = 4 to 10 times, 4 = 11 to 25 times,5 = More than 25 times

Respondents used other modes (bus or rail) of public transit less than the streetcar during the time frame of the study. Responding to a question regarding frequency of use with other forms of public transit, the mean ratings were less than for streetcar usage with a mean of 1.106 (1 = 0). Public bus service was available within the study sites with comparable accessibility.

The preferred destinations while riding the streetcar reinforced the findings of the social interaction analysis whereby restaurants, retail shops, and nightclubs were the highest rated destinations. Respondents were asked where they had ridden the streetcar to within the past 30 days with a comprehensive list of response options. The results as shown below in Table 4.27, indicated a pattern of preferred usage for dining and entertainment destinations on the streetcar. Commuting to work was a low response item with only 4.23% of the trips. As previously referenced in this chapter, only 30% of the respondents confirmed that their place of employment was convenient to a streetcar stop. This finding illuminates a shortcoming of the circulator mode of the streetcars within the study sites. The lack of a more regional connectivity to major employment and retail destinations is a limitation that diminishes the potential of the streetcar system and reduces regular ridership by the residents.

In order to determine if the population's utilization of the streetcar as a means of commuting to work was dependent upon the place of employment being located on the streetcar route, two questions were included in the survey that addressed this aspect of the residents' travel behavior (n = 125). The following statistical hypothesis was formulated:

Table 4.27. Streetcar Destinations.



- H_0: Utilizing the streetcar as a means of commuting to work is independent of the employment location (i.e. being on the streetcar route or not)

- H_a: Utilization of the streetcar for commuting to work is dependent upon the employment location

As shown in Table 4.28, a chi-square test was performed with the following results:

Table 4.28. Chi-Square Test for Independence of Employment Commutes.

	Commuters to Work	**Non-commuters**	**Total**
Respondents Riding the Streetcar to Work	9	0	9
Respondents with Place of Employment Convenient to Streetcar Route	30	86	116
Total	39	86	125
Contingency Table – Expected results			
1	2.81	6.19	
2	36.2	79.8	

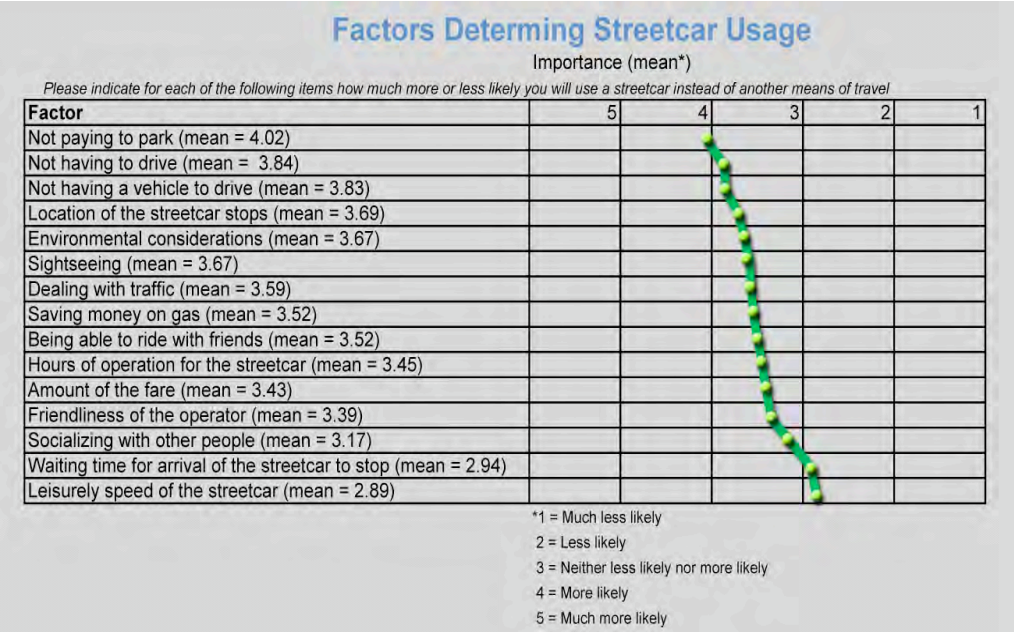
Chi Square = 21.4
Degrees of Freedom = 1
Probability = 0.000 (*p-value*)
Since the *P-Value* = 0.000, H_0 is rejected. Hence, there is statistically significant evidence that ridership to work is affected by the location of the place of employment being on the streetcar route.

Follow up interviews with respondents confirmed a general pattern of the residents primarily utilizing the streetcar for social trips to restaurants, night clubs and retail shopping excursions. As one Memphis resident noted, "I like being able to go out without my car at certain times. I like to go to South Main (Arts District), to the local eateries and hop back on the trolley. I also like going to Beale Street and the FedEx Forum for basketball games and events." A Little Rock expressed similar comments by stating "It's great…… whenever somebody comes down (to visit), we go on it (the

streetcar). We'll go through downtown to different restaurants and shops." However, a North Little Rock resident noted the abundance of "parking available downtown (Little Rock) which encourages automobile driving. This hurts the streetcar." Recognizing the benefits of streetcar access to popular retail destinations in downtown, a Memphis Area Transit Authority official emphasized that "we're working with a major retailer (Bass Pro Shops) on a plan for the Pyramid right now to improve streetcar access and service." A Little Rock developer pointed out the usefulness of streetcar access with the recruitment of new retail shops and dining establishments by noting "when we are recruiting a restaurant or business to our downtown, the streetcar is a thread that connects us…."

To better evaluate the ridership motivations or the reluctance to use streetcars as compared to other modes of travel, a section of the survey asked residents whether they would be more or less likely to use the streetcar based on considerations such as traffic, parking and operational issues. As shown in Table 4.29, residents generally were inclined to use the streetcar when they took into consideration the cost of parking, a desire to avoid driving such as dining or nightclub excursions or simply not having a vehicle to drive. Although somewhat favorable ratings were given by respondents to environmental benefits and less gas consumption, these factors were not ranked as high as the aforementioned convenience and lifestyle considerations. Based on the evidence of the survey, the lower frequency of ridership in streetcars contributes to a lack of observed social interaction among the residents as the excursions were largely inspired by the aforementioned convenience factors associated with dining, special events or similar recreational activities.

Table 4.29. Factors Determining How Much More or Less Likely Respondents Would Use Streetcars Instead of Other Transportation Modes.



Memphis and North Little Rock respondents placed greater importance upon most of the listed factors with parking, environmental considerations and being able to forego driving (not having a vehicle to drive or not having to drive factors) being rated noticeably higher than by Little Rock residents as seen in Tables 4.30 through 4.32. Friendliness of the operator was rated considerably higher by respondents that used the Central Arkansas Transit System (CATS) streetcar system (Little Rock and North Little Rock) than the Memphis streetcar system. It was the practice of the streetcar operators in this study site to treat each streetcar ride like a sightseeing trip by pointing out various landmarks along the route. During follow up interviews with survey respondents, several Little Rock and North Little Rock residents commented on this by stating "I always like to hear the operator point out certain things about the city….", "…the operators are

Table 4.30. Factors Determining How Much More or Less Likely Respondents Would Use Streetcars Instead of Other Transportation Modes for Memphis.

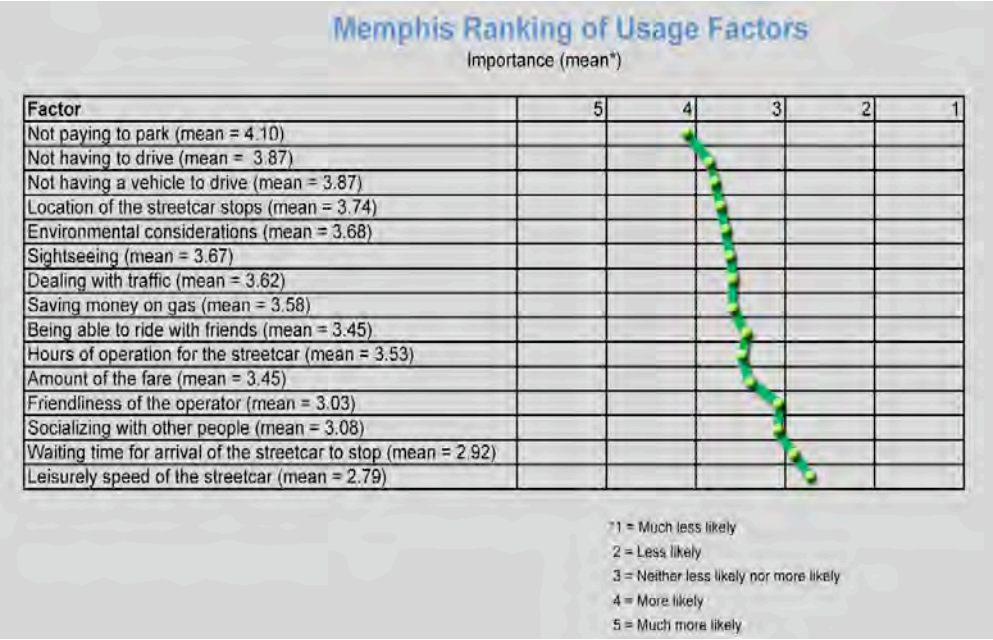
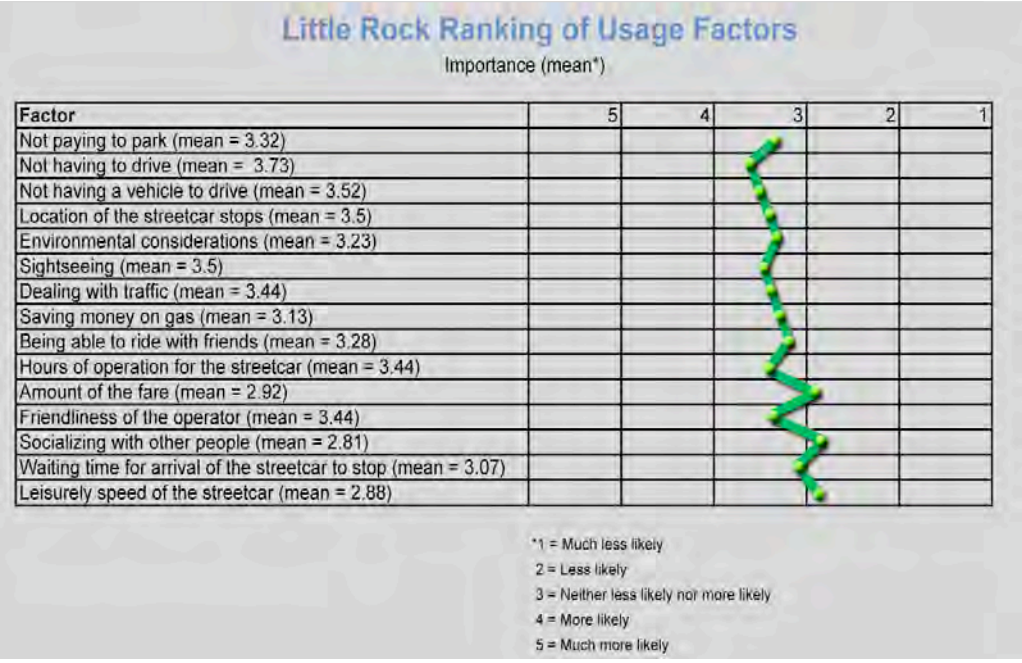


Table 4.31. Factors Determining How Much More or Less Likely Respondents Would Use Streetcars Instead of Other Transportation Modes for North Little Rock.

Table 4.32. Factors Determining How Much More or Less Likely Respondents Would Use Streetcars Instead of Other Transportation Modes for Little Rock.



sometimes good at pointing out landmarks and telling people about the history of Little Rock…" and "I enjoy the sightseeing and the pace of the trolley..."

The waiting time for the streetcar to arrive at the stop received ratings that reflected ambivalence with an overall sample rating of 2.94 (3 = neither disagree nor agree). However, many of the follow up interviews revealed the waiting time to be a deterrent to more frequent ridership. Comments such as "I would ride it more if I knew how much longer I've have to wait…" and "…if you're in a time crunch, we do not take it…" were offered by several interview participants. Citing inconsistent and inefficient service, some respondents stated the streetcar schedule was unreliable with comments such as "…they tell you there's a schedule but it's unreliable…..if it's less than two miles

to where I'm going, then I'll walk…" and "…sometimes you don't know what's happened to it if there's a long wait. Like if there is a back-up or something happened to delay it..." Other survey participants acknowledged the wait but were comfortable with the headways that ran between ten and twenty-five minutes depending upon the route. A North Little Rock resident attributed complaints regarding streetcar service to the automobile lifestyle of today by pointing out that: "…we're so geared in society to jump into the car and taking off. With the streetcar, you have to plan ahead and allow for more time…" During a developer follow-up interview and a respondent interview, both participants cited other transit systems that utilize digital, electronic clocks that indicate when the next streetcar would arrive as a solution for this problem. Acknowledging the perception by many residents that service inefficiency deters increased ridership, one transit planner pointed out that delays are "…also a function of illegal parking (blocking the streetcars)… delivery trucks and even police cars may delay the streetcar…" A Memphis real estate developer stated that the local transit authority "…could be more transit-friendly than tourist-friendly. We need a more efficient schedule where people can track arrival of the streetcar…people have trouble knowing when the trolley will actually be at the stops. MATA should also put a clock on the transit stop so riders will be able to see how much longer before the streetcar arrives..."

Likes and Dislikes of the Physical Characteristics of Heritage Streetcars

The survey also included a section that addressed the relationship of the respondents' feelings towards the physical characteristics of heritage streetcars and whether such characteristics contributed to enhanced feelings of community identity and

social interaction. Respondents were asked about seventeen physical features of the streetcars and related items that covered a wide range of characteristics. The characteristics were briefly described with statements and appropriate response categories based on a five-point scale that ranked the importance of the characteristics. The mean rankings for each characteristic are detailed in Table 4.33.

The highest ranked categories were associated with the historic character of the streetcar including the historic appearance, interior (woodwork and detailing), arrangement of the seats and windows of the streetcars as seen in Figures 4.4 and 4.5. It is significant that these characteristics were character-defining features that contributed to the unique identity of the streetcar. The arrangement of the seats on the streetcars has some of the seats facing each other and shared, double seats is a characteristic that is

Table 4.33. Likes and Dislikes of Physical Characteristics of the Streetcars.

Overall Sample Likes and Dislikes of Streetcar Characteristics

Importance (mean*)

Please indicate for each of the following items how much more or less likely you will use a streetcar instead of another means of travel

Factor	Mean*	5	4	3	2	1
Historic appearance of the streetcar	4.57					
Interior of streetcar (e.g. woodwork, detailing, decorations)	4.5					
Arrangement of seats	4.21					
Windows or window openings	4.06					
Location of the streetcar stops	3.96					
Ability to get on and off the streetcar	3.84					
Friendliness of the streetcar operator	3.8					
Sounds made by the streetcar	3.76					
Historical information provided about the streetcar	3.52					
Speed at which the streetcar travels	3.5					
Comfort of seats	3.43					
Route of the streetcar	3.4					
Signage at the streetcar stops	3.29					
Overhead electrical lines	3.18					
Advertising	3.09					
Placement of the tracks in the road	3					
Length of wait for the streetcar	2.51					

1 = Dislike, 2 = Somewhat dislike, 3 = Neither dislike nor like, 4 = Somewhat like, 5 = Like

Figure 4.4. Vintage Streetcar in Memphis (Photograph by Robert Benedict).

Figure 4.5. Interior of Replica Streetcar in Little Rock (Photograph by Robert Benedict).

conducive to social interaction. The friendliness of the streetcar operator is another characteristic that may contribute to a more socially engaging atmosphere while riding on the streetcar especially with the Central Arkansas Transit System streetcar system where the operators often point out historic landmarks. This characteristic had a moderate difference in mean rankings between Memphis and North Little Rock/Little Rock. The Memphis respondents gave operator friendliness a mean rating of 3.28 while North Little Rock and Little Rock respondents gave operator friendliness a mean rating of 4.57 and 4.17 respectively. A t-test for statistical significance was performed for each of the mean ratings of the study sites to evaluate the statistical evidence for the population M exceeding 3 (neutral). For Memphis, the t-statistic of 3.26 exceeded the t-critical value of 1.67. North Little Rock had a t-statistic of 12.56 which exceeded the t-critical value of 1.69 and Little Rock's t-statistic of 7.8 exceeded the t-critical value of 1.71 thereby rejecting the null hypothesis of the $M \leq 3$.

The only characteristic to receive an unfavorable ranking was "Length of wait for the streetcar". With a mean ranking of 2.51, an unfavorable rating was anticipated based on other survey and interview responses that addressed operating efficiency. Interestingly, respondents gave a more favorable rating (mean of 3.50) to a related characteristic—"Speed at which the streetcar travels" thereby indicating displeasure with the waiting time for the streetcar's arrival but a general level of satisfaction with the speed at which it traveled.

Transit officials reacted with little surprise during the follow-up interviews to the length of wait mean rating. A Little Rock transit manager did state "I thought the mean

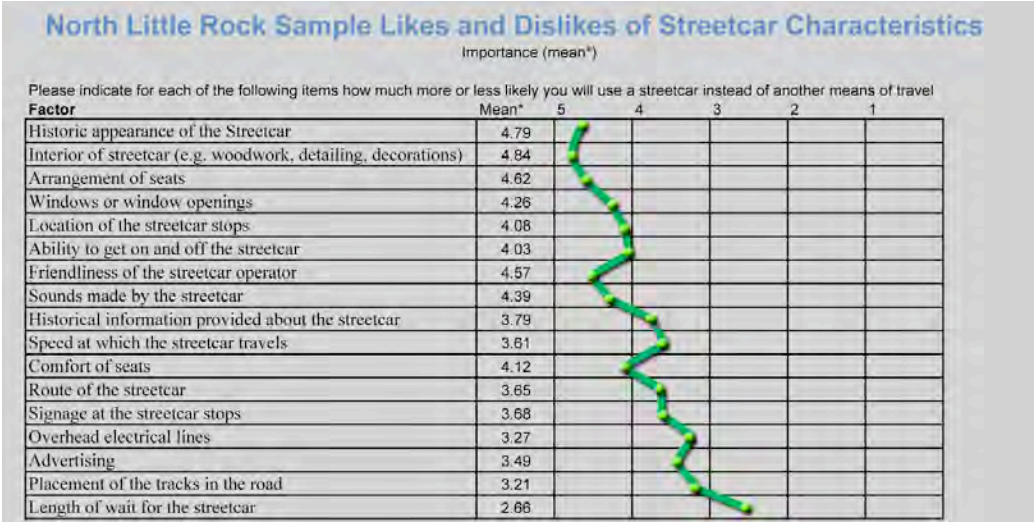
would actually be lower (less favorable). She explained that the longer headways (up to twenty-five minutes) along one of the routes results in occasional complaints regarding this issue. A similar sentiment was expressed by a Memphis transit manager who stated: "This could have been worse. The Riverfront Loop is one-way (south-bound only) and therefore the Main Street streetcar service is perceived to be better. This (length of wait) is also a function of illegal parking, delivery trucks and even police cars that may delay the streetcar." Respondent follow-up interviews revealed numerous comments regarding the length of wait that ranged from unconcern with "Maybe it's because I'm retired and not in a hurry" to impatience as noted by a Memphis resident who stated that "We'll often start to take it (the streetcar) but if we do not see it approaching, we'll walk instead." This respondent also explained that she thought a ten-minute headway was too long with: "If it's a ten minute wait, I'll walk." Respondent perspectives also were a function of whether they viewed the streetcar as a transit mode for commuting to work or strictly social trips. A Little Rock resident stated he liked the "old world" feel of the streetcar but "it's not functional for commuting."

Respondents in North Little Rock and Little Rock gave higher ratings to every characteristic than respondents in Memphis. North Little Rock mean rankings were significantly higher in a number of categories. In addition to the aforementioned "operator friendliness" characteristic, North Little Rock respondents also responded more favorably to characteristics such as "sounds of the streetcar" (mean rating = 4.39), "comfort of the seats" (mean rating = 4.12) and "historical information provided about the streetcar" (mean rating = 3.79). Even "length of wait" did not receive as unfavorable

mean rating from North Little Rock respondents (mean = 2.66) who have longer headways of twenty-five minutes than the ten-minute headways in downtown Memphis (mean = 2.25). A breakdown of mean ratings for the characteristics by study site is shown in Tables 4.34 – 4.36. As conveyed in the follow-up interviews, the North Little Rock respondents were more attuned to their community's historic district designation (Argenta Historic District) and the attachment to streetcars as a link to the history of Argenta as a streetcar suburb. A good indication of this was revealed with the mean ratings related to "sounds made by the streetcar" which was significantly higher among North Little Rock respondents with a mean rating of 4.39 as compared to the Memphis respondent mean rating of 3.35. T-tests were performed for the above-referenced categories to determine the statistical evidence for the population *m* exceeding 3 (neutral). All t-statistical values exceeded the t-critical values indicating statistical significance for the population with the exception of Little Rock's mean rating (3) for the route of the streetcar.

Characteristics related to accessibility, streetcar routes and signage received somewhat favorable ratings as detailed in Table 4.30. "Location of the streetcar stops and the "ability to get on and off the streetcar (as seen in Figures 4.6 and 4.7)" had mean ratings of 3.96 and 3.84 respectively thereby indicating a general level of satisfaction with these characteristics. The "route of the streetcar" also received a somewhat favorable mean rating (3.40) for the overall sample with North Little Rock respondents expressing a higher level of satisfaction with a mean rating of 3.65 as compared to Memphis (3.42) and Little Rock (3). Similarly, the overall sample mean rating for

Table 4.34. Likes and Dislikes of Streetcar Characteristics for North Little Rock.



North Little Rock Sample Likes and Dislikes of Streetcar Characteristics

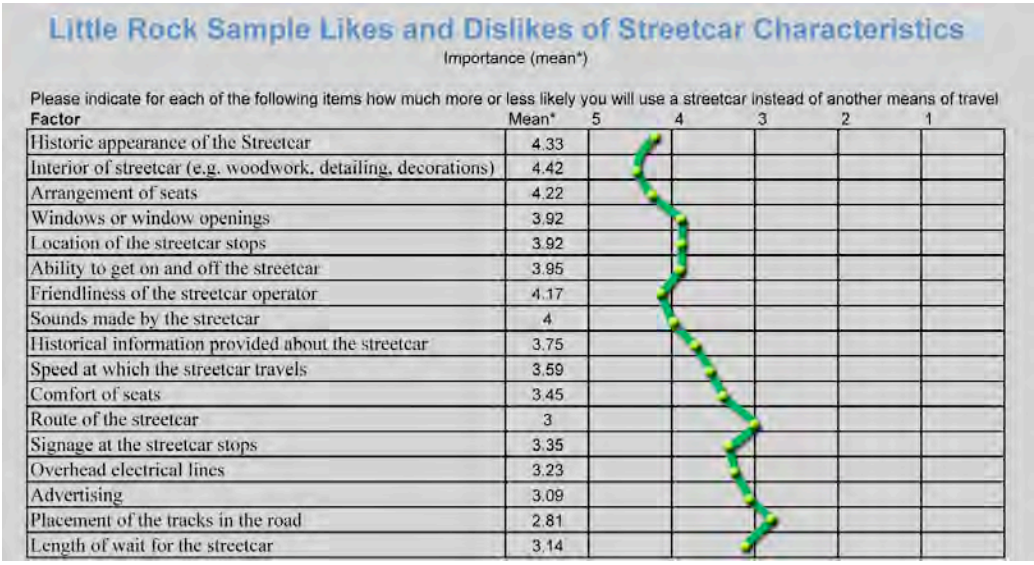
Importance (mean*)

Please indicate for each of the following items how much more or less likely you will use a streetcar instead of another means of travel

Factor	Mean*
Historic appearance of the Streetcar	4.79
Interior of streetcar (e.g. woodwork, detailing, decorations)	4.84
Arrangement of seats	4.62
Windows or window openings	4.26
Location of the streetcar stops	4.08
Ability to get on and off the streetcar	4.03
Friendliness of the streetcar operator	4.57
Sounds made by the streetcar	4.39
Historical information provided about the streetcar	3.79
Speed at which the streetcar travels	3.61
Comfort of seats	4.12
Route of the streetcar	3.65
Signage at the streetcar stops	3.68
Overhead electrical lines	3.27
Advertising	3.49
Placement of the tracks in the road	3.21
Length of wait for the streetcar	2.66

1 = Dislike, 2 = Somewhat dislike, 3 = Neither dislike nor like, 4 = Somewhat like, 5 = Like

Table 4.35. Likes and Dislikes of Streetcar Characteristics for Little Rock.



Little Rock Sample Likes and Dislikes of Streetcar Characteristics

Importance (mean*)

Please indicate for each of the following items how much more or less likely you will use a streetcar instead of another means of travel

Factor	Mean*
Historic appearance of the Streetcar	4.33
Interior of streetcar (e.g. woodwork, detailing, decorations)	4.42
Arrangement of seats	4.22
Windows or window openings	3.92
Location of the streetcar stops	3.92
Ability to get on and off the streetcar	3.95
Friendliness of the streetcar operator	4.17
Sounds made by the streetcar	4
Historical information provided about the streetcar	3.75
Speed at which the streetcar travels	3.59
Comfort of seats	3.45
Route of the streetcar	3
Signage at the streetcar stops	3.35
Overhead electrical lines	3.23
Advertising	3.09
Placement of the tracks in the road	2.81
Length of wait for the streetcar	3.14

1 = Dislike, 2 = Somewhat dislike, 3 = Neither dislike nor like, 4 = Somewhat like, 5 = Like

Table 4.36. Breakdown of Likes and Dislikes of Streetcars for Memphis.

Memphis Sample Likes and Dislikes of Streetcar Characteristics

Importance (mean*)

Please indicate for each of the following items how much more or less likely you will use a streetcar instead of another means of travel

Factor	Mean*	5	4	3	2	1
Historic appearance of the Streetcar	4.55					
Interior of streetcar (e.g. woodwork, detailing, decorations)	4.36					
Arrangement of seats	4					
Windows or window openings	4					
Location of the streetcar stops	3.91					
Ability to get on and off the streetcar	3.73					
Friendliness of the streetcar operator	3.28					
Sounds made by the streetcar	3.35					
Historical information provided about the streetcar	3.3					
Speed at which the streetcar travels	3.41					
Comfort of seats	3.1					
Route of the streetcar	3.42					
Signage at the streetcar stops	3.08					
Overhead electrical lines	3.1					
Advertising	2.9					
Placement of the tracks in the road	2.96					
Length of wait for the streetcar	2.25					

1 = Dislike, 2 = Somewhat dislike, 3 = Neither dislike nor like, 4 = Somewhat like, 5 = Like

Figure 4.6. Passengers Boarding a Little Rock Streetcar (Photograph by Robert Benedict).

Figure 4.7. Memphis Streetcar and Transit Stop (Photograph by Robert Benedict).

signage (3.29) indicated a slight level of satisfaction with North Little Rock respondents indicating a somewhat higher level of satisfaction (mean rating of 3.68).

A number of characteristics were neither liked nor disliked reflecting a reduced level of importance to respondents. These characteristics included "overhead electrical lines" (mean rating = 3.18), "advertising" (mean rating = 3.09) and "placement of the streetcar tracks in the road" (mean rating = 3).

Summary of the Research Findings

The research findings within the theoretical dimensions of community identity and social identity with streetcars revealed two significantly different perspectives. There is strong evidence that residents in streetcar-oriented developments and neighborhoods enjoy an enhanced sense of community identity. Conversely, the research findings indicate little evidence of increased social interaction associated with streetcar activities.

Furthermore, the survey and interview results regarding travel behavior and views of streetcar characteristics provide additional evidence that residents in streetcar-oriented developments consider heritage streetcars to be an amenity that conveys a distinctive image of their community and also provides an enjoyable social experience that is largely limited to irregular outings.

The concluding chapter provides a further analysis of the implications, research limitations and opportunities for future research.

CHAPTER V

CONCLUSIONS, IMPLICATIONS AND RESEARCH LIMITATIONS

The goal of this dissertation was to explore effects of the reintroduction of heritage streetcars upon the residents of streetcar-oriented developments and communities within the study sites of Memphis and Little Rock/North Little Rock. Specifically, the focus of the research was to determine whether heritage streetcars engendered heightened feelings of community identity and if the streetcars promoted environments that fostered increased social interaction among the residents. The research also provided insight into the travel behavior and a sense of the overall preferences and dislikes of the physical characteristics of streetcars by the residents. The findings are first discussed within the context of each of the research questions as set forth in Chapter I followed by a synthesis of the findings of the travel behavior and physical characteristics components of the study.

Do the residents of streetcar-oriented developments have a heightened sense of community identity and attachment with heritage streetcars as distinctive symbols of the community?

Community identity represents a phenomenological integration of experiences related to a particular environment based on the spatial framework of current activity (Fried, 1963; Hashas, 2004). This framework is derived from the sense of community identity that residents have of a specific geographical area, in this case their streetcar-oriented community. This dissertation used a theoretical dimension of community identity with a research design of four indicators to explore residents' attitudes about

their neighborhood as influenced by heritage streetcars. The implications of the research within the context of each of the indicators are presented below.

Distinctiveness

Relph (1976) considered place identity to provide an environment that is distinctive from other places. Place identity is related to community identity which is formed when a community, as a place, fosters an image that residents can identify with and perceive as having its own sense of character (Kim, 2001). Accordingly, the indicator of distinctiveness provided insight into the meanings of the streetcar among the residents in the streetcar-oriented developments and communities. Evidence from the research findings indicates that residents in streetcar-oriented communities consider their neighborhood to be more distinctive than neighborhoods without streetcars. The survey results and subsequent interview findings revealed a high level of significance placed upon streetcars that engendered feelings of distinctiveness that residents placed upon their neighborhood. Additionally, the research findings revealed that most residents view streetcars as a symbol of the neighborhood thereby conveying a unique sense of distinctiveness.

Feelings of distinctiveness or "being different" are evidenced by residents differentiating themselves by associating with a place or group that residents like (Twigger-Russ & Uzzell, 1996; Kim, 2001). Streetcars enabled the residents of streetcar-oriented developments and neighborhoods to enjoy a heightened sense of distinctiveness with several different layers. Many residents primarily identified with the streetcar as an amenity that provides enjoyable social excursions. A number of other residents identified

with the locational advantages associated with their residence on the streetcar line and developed a sense of attachment to their community and the era of early streetcar service.

It was also widely acknowledged that streetcars made a contextual contribution to the streetscape that enhanced the walkable urbanism of the community. The proximity of streetcar stops to the developments and neighborhoods (on average less than 2,000 feet) promoted walkable environments with unique sights and sounds of the streetcar. By combining the transportation mode of streetcars with the character of place, a distinctive form of walkable urbanism is created (Leinberger, 2008). While streetcars were perceived to be a distinctive characteristic of the community, residents considered the integration of the streetcar system into the surrounding environment of their community to be appealing and of a pleasing scale.

Another layer that was revealed by the research involved the way that real estate professionals valued and weaved the distinctiveness of streetcars into their marketing material. The format of the follow-up interviews with real estate developers, investors and property managers specifically inquired about the "branding" of heritage streetcars with projects they had been involved in. Primarily used as a marketing theme that promoted an image of streetcar accessibility, real estate developers and brokers perceived a marketing advantage associated with the streetcar. Similarly, planners and transit officials promoted the image of the streetcar although their emphasis was directed at the local tourism strategy as much as local ridership. In effect, there was a "branding" of the streetcar image with many of the adjacent developments and neighborhoods. The distinctive appearance was considered to be synonymous with the vibrant downtowns and

redevelopment activity that had occurred in both study sites. As a fixture of the main street infrastructure, streetcars were distinctive yet easily recognizable.

Sense of Pride

Within the context of this study, the sense of pride indicator was derived from whether residents were "proud to belong" to their community as a streetcar-oriented community. The unique qualities of streetcar-oriented developments and neighborhoods nurtured feelings of pride with the character and surroundings. Although residential satisfaction is influenced by a number of variables, the contextual contribution of the streetcar and its value as an amenity were evident in the research findings. Survey questions revealed a general feeling that streetcars conveyed a sense of pride among residents. This was especially true among residents in North Little Rock who felt a greater sense of pride with the streetcar because of the enhanced connectivity across the Arkansas River to downtown Little Rock and the feeling that the streetcar provided a tangible link to the evolution of Argenta (North Little Rock) as a streetcar suburb. As stated by a Little Rock planning official, the streetcar "…reintroduced North Little Rock to many people…" helping the community overcome feelings of being in the shadow of Little Rock's vibrant downtown. The question of how the streetcar manifested a greater sense of pride deserves further consideration. Was the streetcar a tangible and easily recognizable symbol for more in-depth feelings of pride associated with the overall revitalization of the community? As Relph (1976) has stressed, it is important for a community to have an identity with places that provide for meaningful experiences. Heritage streetcars provide for meaningful experiences as tangible resources that allow

riders to reconnect and interact with the past. Streetcars were once an integral part of almost every American city that had a population greater than 5ooo people (Graeber, 2008). Memphis, Little Rock and North Little Rock had vibrant streetcar systems that were an integral part of their urban fabric before disappearing in the 1930s and 1940s. With the reintroduction of streetcars in these cities, the residents of Memphis, Little Rock and North Little Rock have rediscovered streetcars as a vital component of their streetscape. In effect, streetcars have come 'full circle', emerging once again as a tangible symbol of the past and facilitating feelings of increased pride with their link to an earlier era prior to the encumbrances of the automobile.

Current Attachment

The underpinning for attachment theory is based upon a determination whether the needs and expectations of the residents are being met with an outcome of satisfaction with their residential environment (Hashas, 2004). The level of satisfaction and attachment is also a function of the interactions of the residents with their physical environment. Streetcars provided an opportunity to promote such interaction by the residents within the study sites. The research findings revealed that current neighborhood attachment was considerably higher among residents of streetcar-oriented neighborhoods as compared to where they previously resided. The evidence from the surveys and interviews indicates that streetcars significantly influenced the level of current attachment felt by residents. This can be attributed to a cognitive bond that residents felt with the streetcar which some respondents viewed with a vested interest as "their" streetcar. Residents convincingly acknowledged the contribution of the streetcar to the unique

character of the neighborhood and expressed satisfaction with the social opportunities it provided.

Attachment to the Past

The reintroduction of streetcars in Memphis and Little Rock/North Little Rock draws from the historic precedent of the role of the streetcar within the evolution of each city. The ability to reconnect and interact with the past has become an important consideration to regain a sense of stability and identity. The evidence from the research affirms the role of heritage streetcars fostering a unique sense of community identity associated with an ability to connect with the past. The evidence was especially compelling in North Little Rock with respondents having a keen awareness of their community's early development as a streetcar suburb. The historic character of many of the developments in Memphis and North Little Rock seemed to have more influence on the level of awareness of the streetcar's link to local history. With the exception of Tuf Nut Lofts, most of the Little Rock respondents resided in newer and more vertical, condominium developments. The research findings for Little Rock were consistently lower for levels of attachment to the past, the importance of the historic characteristics of the heritage streetcars and social interaction. The summary section of this chapter discusses the implications of the newer, high rise developments of Little Rock.

Within the theoretical dimension of community identity, the indicator of attachment to the past was embedded with the streetcars and the residents' interpretation or meanings of the "…old time feel…." of the neighborhood. Several older respondents recalled the streetcars as small children and exhibited an especially strong sense of

attachment to the past with the streetcars as one of the few tangible links remaining with their past.

Summary of Community Identity Indicators

The findings of this dissertation provided evidence that residents in streetcar-oriented communities have a heightened sense of community identity as a result of the above-referenced indicators. This study also indicates that heritage streetcars play a vital role as a symbol for the community. The implications of the study reveal higher levels of current neighborhood attachment and a greater sense of attachment to the history of the community. It is also reasonable to conclude that residents of streetcar-oriented communities are influenced by the contextual contribution of the streetcar towards the character of their neighborhood which they perceive as more distinct than other neighborhoods.

Pursuant to the findings of this study, what is the role of heritage streetcars with community identity? As the evidence from the study indicates, they are distinctive symbols of a community's past history and they allow for a meaningful experience by riding and participating in a transit mode as it was experienced a century before. Streetcars are also a tangible link to the past and therefore work best in a contextual environment with historic resources and in a city that previously had streetcar service. Accordingly, they help promote heritage tourism but without regional connectivity, heritage streetcar systems are destined to be stand-alone circulator modes of transit that primarily serve tourists. Local residents identify with heritage streetcars as a distinctive

symbol of their community but restrict their use of the streetcar to mostly social excursions which limits the full potential of a heritage streetcar system.

Do the residents of streetcar-oriented developments have a greater sense of social interaction with their neighbors?

One of the expected outcomes of this research was the likelihood that streetcars facilitated an environment of increased social interaction among residents in streetcar-oriented developments and neighborhoods. The characteristics of heritage streetcars and their circulator mode of transit contribute to an environment of enhanced pedestrianism with a seamless integration into the streetscape. Streetcar advocates have promoted streetcars as a welcoming and friendly means of public transit that is appealing to tourists and residents alike. The survey results and follow-up interviews did reveal some expected trends but the research also revealed the very limited social interaction resulting from streetcar-related activity among residents. The theoretical dimension of social interaction consisted of three indicators to explore residents' social activities centered upon heritage streetcars. The implications of the research within the context of each of the indicators are presented below.

Informal Interaction

Based upon the premise that riding, waiting for and walking to streetcars created opportunities for unplanned, casual encounters with neighbors, the survey research asked residents about specific social activities within the previous thirty days. The study results indicated little informal social encounters with neighbors arising from streetcar-related activities. The frequency of the specified activities occurred at sporadic rates with

occasional, informal encounters. This is consistent with streetcar travel patterns that revealed only an occasional use of the streetcar which was primarily for social excursions. The low levels of informal social interaction can be largely attributed to the respondents' irregular use of the streetcars with average ridership for the overall sample being less than three times per month (Table 4.24). Unlike bus ridership in the study sites, the streetcar was used very little for commuting to work. Only 4% of the trips by the respondents (Table 4.25) were to the place of employment. Regular ridership on public transit to and from work creates an environment that promotes more informal social interaction with the same riders utilizing public transit. Unfortunately, opportunities for such encounters on the streetcars were rare. Despite the feelings of attachment and favorable reactions to the physical characteristics of heritage streetcars, residents found very limited opportunities for the type of informal social interaction that regular ridership on public transit can offer.

Formal Interaction

Although the majority (56%) of the streetcar trips were made with friends or family, the survey results revealed very few instances when residents made plans for formal activities as a result of streetcar activities. The mixed-results of this indicator seemed to reveal that streetcars, when ridden, helped facilitate formal interaction by providing for an enjoyable mode of travel with friends and family but the plans were typically made in advance and not while riding or accessing the streetcar.

Community Participation

The role of streetcars and community participation was included as an indicator of social interaction to explore whether residents were more actively involved in neighborhood and community affairs than in their previous, non-streetcar neighborhood. The survey results were mixed with slightly higher levels of involvement in homeowners associations, civic-related, historic and performing arts organizations. This is consistent with the findings of current neighborhood attachment under the theoretical dimension of community identity. Evidence from the study indicates increased opportunities for social interaction with these activities among residents. The strong neighborhood cohesion of North Little Rock revealed more encounters with neighbors during community activities. Although the contribution of the streetcar towards community participation should not be viewed more than an indirect contribution, the streetcar provided a symbol that defined the related developments and neighborhoods within a vibrant community, factors that fostered community participation.

Summary of Social Interaction Indicators

The study revealed little social interaction among residents while riding or waiting for streetcars. Despite the limited results of this study regarding social interaction, further research is needed to gain a more comprehensive understanding of the implications of residents' travel behavior and social interaction. For example, do residents' primarily use streetcars as an amenity to enhance their social excursions? The lack of dependence upon streetcars as an essential mode of transit limits the opportunities for increased social interaction. However, the contextual contribution to the streetscape

promotes a walkable environment which is a consideration that should not diminish the benefits of the streetcar.

It is the contextual contribution of heritage streetcars should enable them to fulfill a role facilitating increased social interaction. They complement walkable, compact environments that promote street activity. By stopping every 1,000 to 1,500 feet, they promote an intensity of uses and streetcars are slow (8 to 10 miles per hour) so they do not threaten pedestrians while being integrated seamlessly into the surrounding street environment (Poticha & Ohland, 2008).

More extensive research on the travel behavior of the residents would be insightful and would enable planners to better evaluate the context of streetcars as an amenity with social benefits as compared to an alternative mode of public transit.

Travel Behavior

Although the recession of 2008 resulted in a decline of the number of streetcar passengers in both study sites (2% reduction in Memphis and 16% in Little Rock/North Little Rock), the Memphis Area Transit System and Central Arkansas Transit System have generally experienced steadily increasing ridership since the reintroduction of their streetcar systems. The national trend of record-setting public transit ridership in recent years has benefitted streetcar ridership and a comparison of 2006 and 2007 passengers showed that "…streetcars and trolleys had the highest percentage increase (10.3%) in transit ridership…" (Johnson, 2008). Therefore, it was anticipated that ridership among the residents of streetcar-oriented communities within the study sites would have been more favorable. This study concludes that residents' streetcar usage was moderated by

several factors. Although the research provided evidence of a general awareness of streetcar accessibility and an appreciation of streetcars as an alternative mode of transit, there was limited reliance upon streetcars as a regular means of travel. Accordingly, the perception of streetcars among the residents was primarily that of an amenity that was available for social excursions. Residents did use the streetcar more than other forms of public transit such as bus service which is also indicative of the amenity perception of streetcars. The majority of the streetcar destinations (Table 4.26) among residents were dining establishments, retail shops and nightclubs with streetcars enhancing the experience of the trip but occurring on an irregular basis. Based on the study's findings, there was no evidence of a reduced dependence upon automobiles among the residents in streetcar-oriented developments.

Although the study uncovered a wide range of motivations for riding streetcars within the study sites, the majority of respondents placed a greater level of importance upon convenience factors. The primary considerations were to minimize the inconvenience of parking or driving a vehicle while going out at night. The irregular use of streetcars likely contributed to only moderate levels of importance placed upon environmental considerations as compared to the convenience benefits of the streetcar. Although environmental considerations warranted a slightly higher ranking than "saving money on gas" and "dealing with traffic", convenience considerations were of greater importance. At the time of the survey research in November and December of 2008, gasoline prices had dropped significantly to approximately $1.60 per gallon (unleaded regular) in the Memphis and Little Rock/North Little Rock study sites. With gasoline

prices expected to increase in future years, residents will likely place a greater importance upon "saving gas" as a consideration for riding the streetcar.

Despite the study's finding that length of wait was a deterrent for more frequent ridership, residents liked the relaxing pace of the streetcar and the sightseeing aspects of the route. Once aboard, the respondents did not express displeasure with the speed of the streetcar which averages less than ten miles per hour. The circulator route with stops of less than ¼ mile apart seemed to be compatible with the walkability and the route of the streetcar. In other words, residents enjoyed the ride but had little patience for a length of wait that seemed excessive. The general tendency for the majority of public transit riders is to have short headways that minimize their waiting time which is ideally less than ten minutes for streetcars. In reality, headways are determined by a compromise of cost considerations and passenger convenience (Vuchic, 2005). Additionally, the stress of waiting time can be exacerbated with exposure to unfavorable weather and schedule disruptions. In an effort to reduce the stress associated with unknown arrival times, Memphis Area Transit System has been investigating the use of real-time arrival systems with global positioning technology and station signage (Lancaster, 2009). Due to the smaller scale of service in Little Rock and North Little Rock, Central Arkansas Transit System has no plans at this time to pursue real-time arrival systems. A more detailed description of how real-time arrival systems might be integrated into a streetcar system is covered in the recommendations section of this chapter.

Another aspect of the travel behavior of the residents that deserves further comment is the friendliness of the streetcar operator and whether it influenced ridership

motivation. The friendliness of the Central Arkansas Transit System (Little Rock/North Little Rock) operators received favorable rankings and contributed to the enjoyment of the streetcar experience in these study sites. The CATS operators made a special effort to point out landmarks and socially engage the passengers on each trip thereby enhancing the experience. Memphis operators did not receive as high a friendliness rating which may be the result of not using a "tour" approach as in Little Rock/North Little Rock. The Memphis operators appeared to be very accommodating with questions related to landmarks and directions during the fieldwork stage of the study. However, the level of social engagement with passengers was noticeably different between the study sites and was reflected in the survey and interview responses.

The opportunities for social interaction associated with "riding with friends" and "socializing with other people" also received only moderate ratings indicating a lower priority by the residents than the aforementioned convenience considerations. Consistent with the research findings detailed in Chapter IV, the travel behavior related to the residents' use of streetcars provided only limited opportunities for increased social interaction. The general feeling among the respondents was a desire to use the streetcar more often but operational inefficiencies influenced the willingness to use them on a regular basis if time considerations were a factor. Flexibility with social excursions and a more leisurely trip enabled residents to use the streetcar for these destinations without the rigidness of being at work on time or with other daily requirements mandated by a set schedule.

Based on the findings of the study, what is the basic function of heritage streetcars as a mode of transit? They are a circulator mode of transit that works best within a two to three mile route that distributes people in a downtown environment. The two to three mile area in an urban environment is generally too far for most people to walk and is not feasible for short automobile trips due to parking and traffic considerations. With their frequent stops, streetcars provide an accessible mode of transit for pedestrians with nearby destinations. Buses are less expensive but the fixed-guideways of streetcars signify a long-term commitment to residents and real estate developers that buses do not with routes that can change (Weyrich, 2002).

However, without connectivity beyond the aforementioned 2 to 3-mile route, streetcars are limited to a tourist-oriented mode or for social excursions by the residents. This is a limitation of the Memphis and Little Rock systems. Their stand-alone systems are not achieving one of the basic purposes of public transit with an effective integration into a regional system to demand generators such as major employers, regional retail destinations and airport service.

Despite the aforementioned limitations of heritage streetcar systems, streetcars are a cost-efficient alternative mode of transit. Streetcars cost about one-third of the cost of light rail. Streetcars average $12 to 15 million per mile as compared to light rail running from $30 to 50 million per mile (Poticha & Ohland, 2008). As detailed later in this chapter, a cost comparison between "modern" and heritage streetcars is also substantial.

By themselves, streetcars are not a catalyst for development to occur. However, they complement walkable, compact environments that promote street activity. While

promoting street activity, streetcars provide social and character-defining benefits that enhance the urban fabric and support the viability of a downtown while fulfilling a circulator mode of transit.

Likes and Dislikes of the Physical Characteristics of Heritage Streetcars

The relationship of the appearance and characteristics of heritage streetcars was explored to gain insight whether heightened feelings of attachment resulted from their historic character. Consistent with the findings of distinctiveness and attachment within the theoretical dimension of community identity, characteristics associated with the historical appearance of heritage streetcars generated the most favorable responses. The exterior appearance, interior detailing, windows and arrangement of the seats received favorable rankings and were considered to be the attributes that enhanced the experience of riding a streetcar. The intricacy of the wood detailing and polished brass features of the streetcars' interior were brought up by many of the respondents as reasons for the high ranking of the interior characteristics. The interior characteristics of heritage streetcars contributed to a unique riding experience with craftsmanship that residents were not accustomed to seeing with other modes of public transit. Other features such as the windows and seating arrangement of heritage streetcars provided an openness that respondents liked. Interviews revealed that residents considered the historic appearance of the streetcar to be a pleasing addition to their community. The streetcar's contextual contribution is seamless with tracks that are embedded into the existing roadway and a scale that doesn't obstruct surrounding buildings or trees. Less tangible are the sights and

sounds of the streetcar. The sounds of the streetcar bell and slight vibration of a passing streetcar were welcome offsets to the every day automobile and truck traffic.

The overhead electric lines were generally viewed as unobtrusive and residents considered them to be an integral part of the infrastructure. The initial route of the Memphis streetcar system was reintroduced in 1996 and the River Rail route of the Little Rock/North Little Rock system commenced operations in 2004 thereby allowing sufficient time for the novelty of the overhead hangers and support system to become commonplace in the eyes of the residents. In some cases, the overhead support structures associated with electrified transit systems have been considered to create negative visual impact (Kimley-Horn, 2007). However, the research findings did not reveal this characteristic to have an impact either in a positive or negative manner upon the streetscape of the study sites.

Likewise the attitudes towards advertising, route of the streetcar, and signage indicated a mild level of satisfaction among residents. The location of streetcar stops received the highest mean ratings except for the characteristics addressing the historic features thereby indicating that the residents were generally pleased with the proximity, accessibility and distances between stops which averaged 1,320 feet in Little Rock/North Little Rock and 1277 feet in Memphis. The signage at the streetcar stops did reveal mixed feelings as most residents indicated a satisfaction with the theme of the signage and its visibility. However, interviews also uncovered a desire by some to see the addition of an "arrival clock" for the next streetcar. This is discussed in more detail under the recommendations in this chapter.

The only characteristic to receive an unfavorable rating was "length of wait for the streetcar". As expected, residents expressed dissatisfaction with the waiting time although the reaction to this characteristic was more pronounced in Memphis where some interview participants expressed frustration about the lack of a published schedule. Memphis Area Transit System promoted the frequency (headway) on their web site and in recorded messages on the MATA "hotline". Headways were ten minutes on the Main Street and Riverfront routes and twelve minutes on the Madison Avenue route except for Sundays when all headways were twelve minutes. This compared to headways of fifteen to twenty five minutes in Little Rock and North Little Rock. Despite the longer headways in this study site, the residents did not give this characteristic a lower rating than Memphis. Evidence from the study indicated that the availability of a published schedule based on set times in the Little Rock/North Little Rock study site enabled residents to plan streetcar trips with less time waiting at the stop.

Implications of the Research Findings

Proponents of transit-oriented development have long touted the multiplicity of benefits ranging from increased public transit ridership and economic development to societal benefits such as reducing sprawl. However, more ambitious aspirations include "strengthening the bond between residents and their community" and "building human capital by increasing day-to-day social interaction" (Transportation Research Board, 2004, p. 119). Streetcar-oriented development, as a form of TOD, has the potential to provide benefits of heightened community identity through "community bonding" and increased social interaction. Both dimensions accrue to the public with spill-over effects

as illustrated in Putnam's *Bowling Alone* whereby less-dependent automobile environments lead to more social interaction and community engagement (Putnam, 2000; Transportation Research Board, 2004).

It is this broader scope of benefits associated with streetcar-oriented development that goes beyond transit objectives centered upon ridership. Heritage streetcars have the opportunity of "bringing more people into face-to-face contact", and engendering more social interaction (Duany et al. 2001; Calthorpe & Fulton, 2001, p.5). Unfortunately, the findings of this research revealed very little social interaction related to streetcar activities among the residents. By failing to tap the full potential of increased social interaction, one of the implications is less engagement with street-level activity that fosters a vibrant, compact downtown. Farr's (2008) concept of sustainable urbanism is based upon walkable and transit-served neighborhoods, districts and corridors that generate social benefits derived from neighborhoods having "a finite social network…. that encourage socialability" while concentrating development near transit stops that promotes pedesterian activity (Farr, 2008, p. 43). In its present form, the streetcar systems of the study sites are not capitalizing on the full potential of the street activities that full-time residents can support through regular streetcar ridership and daily contact with their friends and neighbors. Although the heritage streetcar systems complement the tourism strategy within the study sites, the systems will continue to be primarily a tourist-based mode of transit and viewed by the residents as an amenity that is available for occasional social excursions unless more frequent ridership is generated. The discretionary nature of the visitor/tourist market also makes the streetcar systems in the study sites vulnerable to

economic downturns which will have an adverse impact upon operating revenues and service (Wilson, 2006).

The research uncovered infrequent use (1 to 3 times per month) of the streetcar among residents and destinations primarily limited to dining, nightclub and retail excursions. Employment destinations were fewer than 5% of the trips and less than 30% of the respondents indicated their place of employment to be on the streetcar route. Without connectivity to employment destinations, the residents were not afforded the opportunity to have regular social contact by utilizing the streetcar for daily commutes and interacting with neighbors on a regular basis. Related activity of encountering neighbors while waiting or walking to streetcar stops is also diminished without more frequent streetcar usage by the residents. One of the purposes of a neighborhood is to have the proximity of one's neighbors to be an asset instead of a liability (Brain, 2005). A shortcoming of the limited social interaction among Memphis and Little Rock residents with streetcar–related activities is the unfulfilled potential of *placemaking*, creating human-scale environments that are attractive and memorable not only to visitors but also to the residents (Transportation Research Board, 2004).

The evidence from the study indicates a heightened sense of community identity and attachment resulting from heritage streetcars. Their appearance and symbolism of the past enable the residents to have favorable feelings of heritage streetcars but the research reveals an increased need to overcome perceptions of operating inefficiencies to generate more frequent ridership among residents in streetcar-oriented developments.

Implications for Cities Considering Heritage Streetcars

Based on the aforementioned implications, what should planners and transit officials do in other cities that are considering the reintroduction of heritage streetcars? How can they avoid the limitations of a stand-alone system that draws from a visitor/tourist-based market while encouraging regular ridership among residents?

The fundamental question for planners is whether the intended purpose of the heritage streetcar system will be to serve a tourism market and project an image that complements the scale and historic character of the surrounding built-environment. Planners should first determine if the heritage streetcar system is to be "transportainment" or a serious mode of public transit (Taylor, 2008, p. 24). If the proposed heritage streetcar system is to be a stand-alone system that caters primarily to tourists, planners and transit agency officials should develop a strategy separate that also encourages regular ridership among residents in streetcar-oriented developments and neighborhoods. In an effort to encourage increased regular ridership to daily destinations such as employment centers on the streetcar route, steps should be undertaken to overcome perceived operating inefficiencies and ameliorate schedule-induced stress at streetcar stops. The research revealed *length of wait* and *predictability* as deterrents as a deterrent to more frequent ridership and planners and transit officials should address this issue with the implementation of real-time arrival systems and other programs as detailed below.

A second essential question pertains to the connectivity of the streetcar system to existing or future modes of public transit. Heritage streetcar systems can be effective "starter" systems for larger, regional systems that more effectively link major

employment centers, regional retail destinations and airports. Charlotte 's LYNX light-rail system had a predecessor heritage streetcar system that introduced public transit ridership to many of the riders and created the momentum for passage of a sales tax referendum that funded Charlotte's 2025 Transit Plan (Dickey, 2008). Consideration of whether the streetcar route can be extended as transit priorities change and external modal connectivity are critical factors for the long-term objectives of the heritage system. A heritage streetcar system that is effectively planned to connect to major demand generators with regional access fulfills the role of a downtown circulator system that serves the "last mile" connecting residents' homes with jobs and other key destinations (Taylor, 2008, p. 24).

Recommendations

An underlying objective of this study was to provide a clearer understanding of the attitudes of the residents in streetcar-oriented developments and neighborhoods and whether streetcars served a social purpose while enabling planners, transit officials and real estate developers to effectively collaborate and achieve mutual goals of increased ridership in existing developments and neighborhoods. The study provided strong indications that heritage streetcars play an important role fostering a heightened sense of community identity by making a significant contribution to the distinctiveness and levels of attachment to streetcar-accessible neighborhoods. However, the disconnect between the favorable views of the streetcar and more frequent ridership diminishes the potential of the streetcar to residents by undermining some of the essential qualities of transit-

oriented development that help to reduce the level of dependency upon automobiles and promote a high level of transit ridership.

As noted by Peter Calthorpe (2004), transit-oriented development has evolved from a primary focus upon light rail to a less exclusionary direction that includes streetcars with other modes of transit types. As pointed out by Robert Cervero, Christopher Ferrell and Steven Murphy (2002), transit-oriented development creates additional benefits with a broader scope than just transportation by "bringing more people into everyday face-to-face contact, and engendering more social and cultural diversity…" (Duany et al., 2001; Calthorpe and Fulton, 2001 p. 5).

Although heritage streetcars play a major role in the tourism strategy of the study sites, there is also increased exposure to economic conditions and rising gasoline prices that affects a ridership market primarily focused upon out-of-town visitors. As experienced in 2008, the reduced ridership in both study sites was attributed to fewer tourists. Conversely, increasing the ridership among local residents in the streetcar-oriented developments reduces the vulnerability associated with a tourism-based strategy. Although one of the primary objectives of the streetcar system in both study sites was to provide a circular transit mode that linked tourist destinations, economic downturns can have an adverse impact upon a tourist ridership. Increased ridership from permanent residents can in effect act as a hedge with higher streetcar use during times of higher gasoline prices which have a detrimental effect upon tourism. How can the stakeholders (i.e. transit officials, planners and real estate developers) collaborate more effectively so

that streetcar-oriented developments achieve the mutual goals of classic transit-oriented development?

- ***Build upon the results of this study for direction to overcome the limitations of heritage streetcars***

  The results of this study provided needed insight into the broader perspectives of the residents' attitudes towards streetcars and the foundation for determining what role heritage streetcars should play. The over-arching question that deserves careful consideration is whether the heritage streetcar systems in Memphis and Little Rock/North Little Rock should remain stand-alone systems that primarily serve tourists or whether improved connectivity with other modes of transit will increase local ridership. Memphis currently has an intermodal station in the Pinch District which provides dual bus and streetcar service. The Memphis streetcar also serves the local Amtrak station in the South Main Arts District. However, with the exception of the medical district in Memphis, many of the demand generators such as large employers, regional retail destinations and the airport are not currently served by the streetcar system in either study site. As a circulator mode of transit, streetcars work best with regional connectivity otherwise they are destined to remain largely a tourist-based transit mode or as the study revealed, an amenity for residents that is occasionally used for social excursions.

  An initial step of building upon the research should be to create special ridership incentives to entice more residents to use the streetcar on a more regular basis and reduce the market dependence upon out-of-town visitors. Examples of such programs are:

  - A "Welcome to Our Streetcar Community" or "Let's Get Re-Acquainted" program for residents in the streetcar-oriented developments could offer special incentives such as a 30-day reduced fare ticket for unlimited rides. Collaboration with participating developers and landlords would allow them to purchase the passes for the residents or absorb some of the cost. The developers could then use the passes as a marketing incentive to help secure new tenants, for lease renewals or for purchasers of the residential units.

  - Issuance of special fare passes based on increased ridership have been successful with other transit agencies whereas if the transit agency experiences an increase of a pre-determined percentage over a set time frame that is usually six months to one year, regular passengers are rewarded with reduced fare passes.

- ***Utilize automatic vehicle location (AVL) systems to display streetcar arrival information***

  There is an increased utilization of Global Positioning System (GPS) – based AVL systems or real-time arrival systems by transit agencies to display the waiting time ("smart signs") and service disruptions for public transit modes (Goodwill & Hendricks, 2002). Although first used with bus and heavy rail systems, real-time arrival systems are proving to be adaptable for most public transit modes (see Figures 5.1 and 5.2) and the latest generation of real-time arrival systems provides information over the Internet or wireless web devices. Survey information of the public's reaction to real-time arrival systems has been very favorable as evidenced by the First World Congress survey in 1994 that revealed the following advantages:

  - 65% of the passengers surveyed believed waiting times were shorter when they could see the estimated arrival time.
  - The perceived waiting time dropped over three minutes.
  - Almost two-thirds of the passengers believed service efficiency had improved when the opposite was true.
  - Survey respondents stated they experienced less stress while waiting for the streetcar to arrive when the estimated time of arrival was displayed (Schweiger, 2003; Kimley-Horn, 2007).

Real-time arrival systems and "smart signs" are currently used with bus systems in Minneapolis/St. Paul, San Francisco, Montgomery County, Maryland and King County, Washington with streetcar applications in Portland (Goodwill & Hendricks, 2002; Kimley-Horn, 2007). Portland's Tri-Met streetcar installed dynamic messaging signs at transit stops and global positioning technology in all 689 vehicles of its bus, light rail and streetcar fleet with capital costs totaling seven million dollars based on approximate unit costs of $4,500/vehicle and $3,000-$4,000 per sign (Kimley-Horn, 2007). An evaluation of the Portland streetcar real time system was conducted in 2006 by Hiu Sui Ng for a civil engineering class at Portland State University. Although the

Figure 5.1. Portland Streetcar Next Bus Real Time Arrival Sign. Photograph Courtesy of Portland Transport web site – http://Portlandtransport.com

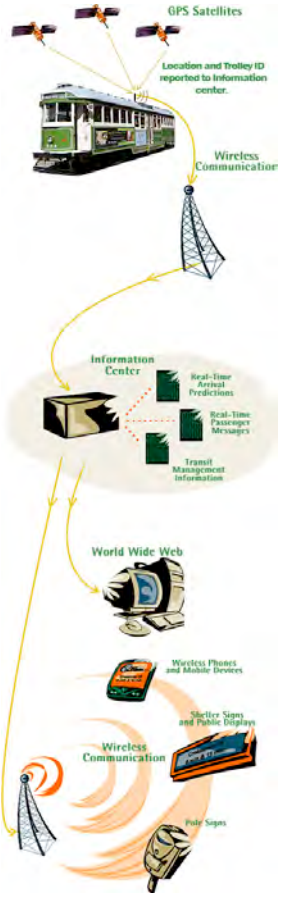


Figure 5.2. AVL Diagram. Courtesy of Next Bus, Inc.

small sample size created some research limitations, actual streetcar arrivals were within an average range of 1.32 to 1.35 minutes of the predicted time on the sign and .83 minutes of the printed schedule (Ng, 2006). The cost of real-time arrival systems can vary greatly depending upon the needs of the transit agency and related infrastructure costs such as installing conduit to transit stops. Memphis has recently researched costs for a comprehensive intelligent transportation system for the full fleet of buses and streetcars. Preliminary cost estimates for vehicle location systems, passenger counters, voice enunciation components and vehicle health monitoring systems were in the ten million dollar range with the vehicle location systems per streetcar or bus running approximately $13,158 each (Lancaster, 2009).

The Memphis streetcar system has 24 stops at cross-streets with inbound and outbound service (total of 35 stops) which will be suitable for real-time arrival signs. There are a total of 19 streetcar vehicles in the active fleet with 12 typically operating at peak time thereby requiring a much higher capital outlay for the real-time arrival system. However, with streetcar ridership ranging between 900,000 to over 1,000,000 over the past several years, a potential increase in ridership could be significant within the upcoming years and help offset the capital cost. Based upon the preliminary cost information as provided by Memphis Area Transit Agency and Kimley Horn, the estimated cost for a real-time arrival system is shown in Table 5.1.

In the case of Little Rock/North Little Rock, implementation of a real-time arrival system would be approximately $165,000 based upon the following specifications as shown in Table 5.2.

Table 5.1. Estimated GPS and "Smart Sign" Cost for Memphis.

Memphis Area Transit System Streetcar			
	Number Required	**Unit Price**	**Totals**
Global Positioning Systems	19 vehicles	$13,158	$250,002
Digital Arrival Time Signs	24 signs	$9,000	$216,000
Total Capital Cost			$466,002

Source: John Lancaster of Memphis Area Transit Agency and Kimley-Horn and Associates, Inc.

Table 5.2. Estimated GPS and "Smart Sign" Cost for Little Rock/North Little Rock.

Central Arkansas Transit System Streetcar			
	Number Required	**Unit Price**	**Totals**
Global Positioning Systems	3 vehicles	$13,158	$39,474
Digital Arrival Time Signs	14 signs	$9,000	$126,000
Total Capital Cost			$165,474

An additional benefit of real-time arrival systems is the reduced waiting time at the streetcar stop. The availability of streetcar locations and arrival times on the World Wide Web and wireless devices including Personal Digital Assistants (PDAs) and internet accessible cellular telephones can reduce the amount of time waiting at the streetcar stop. Within both study sites, there are numerous cafes and coffee shops with wireless internet access making it conducive for streetcar passengers to check on the location of the streetcars while waiting inside these establishments. Residents can also stay in their residence longer before leaving to catch the streetcar thereby allowing for more personal time at home.

Related Recommendations for Streetcar-Oriented Developments

Although not directly related to the outcomes of this research, there additional recommendations for promoting future streetcar-oriented developments that can be beneficial to planners, transit officials and real estate developers. The process of creating TOD neighborhoods that complement heritage streetcars is an incremental process. Although this study was centered on residents' feelings of community identity and social interaction related to heritage streetcars, the momentum of additional transit-oriented development will help overcome the limitations of a stand-alone streetcar system that prioritizes tourism. Follow-up interviews with real estate developers, planners and transit agency officials uncovered a mutual desire for additional, streetcar-oriented development. Therefore, several related recommendations are proposed that can be beneficial for future development within the study sites.

Well-formulated policy guidelines and meaningful developer incentives ensure a greater chance of success and create a distinctive environment for the community and the heritage streetcar system. However, it is widely perceived by developers that transit-oriented development entails higher risks than standard, suburban development. Local government policy can offset some of the risk by creating incentives such as an expedited permit review process, waivers of impact fees, property tax abatement programs and density bonuses.

- Create special incentives for real estate developers with streetcar-oriented projects

  Tax incentive programs with transit-oriented development have been effectively used in Seattle and by the state of Oregon. In Oregon, enabling

legislation was passed that allows local municipalities a program to offer a property tax exemption for ten years on transit-oriented developments that meet mixed-use or multi-family housing requirements (Goodwill & Hendricks, 2002).

Expedited permit review programs have been used with eligible, transit-oriented developments near Metro stations in the Washington, D.C. area based on compliance with pedestrian-friendly and public space design criteria (Goodwill & Hendricks, 2002). By helping reduce the entitlement process, local government entities in effect provide a financial incentive by reducing the construction interest incurred by a developer on the front-end of a development. Although the plan review process in Memphis and Little Rock is not as onerous as in other cities, the recent financial crisis has made it increasingly difficult for developers to obtain project financing. An expedited permit process provides a mechanism to reduce project exposure with volatile financial markets and commence construction with a reduced entitlement process.

- Transit agencies should develop in-house expertise on development issues

Larger transit agencies are more interested in playing an active role in transit-oriented development. Accordingly, there is an increased interest to develop the in-house expertise to improve the collaboration with real estate developers. By developing the acumen to deal with issues such as real estate finance, property law, and regulatory issues, transit agencies are more attuned to the barriers encountered by developers on most transit-oriented developments and can lend useful assistance. Transit agencies such as Charlotte and Portland have hired real estate professionals as transit-oriented development managers with a primary responsibility to help real estate developers and city officials plan projects that more effectively achieve capture value from quality place making and desirable connectivity between public transit and the community (Dittmar & Ohland, 2004).

In the study, sites of Memphis and Little Rock/North Little Rock, follow-up interviews revealed a positive level of interaction between the development community and the transit agencies. However, in both instances, the interaction was largely limited to post facto dialogue regarding whether a streetcar stop could be relocated (as was the case with one Little Rock development) or information regarding operating schedules or fares. With in-house real estate managers, the transit agencies can play a more active role in helping developers plan future streetcar-oriented developments and also collaborate on programs to increase ridership among the residents in existing streetcar-oriented developments.

Transit-oriented development benefits more from the leadership of a transit agency that has a comprehensive view of its objectives that includes

stimulating additional development rather than a singular goal of increased productivity (Greenberg, 2004). The level of real estate development activity within the central business districts of both study sites has been significant and more recent developments have become larger in scope with more mixed-use projects. Over $200 million of development activity has occurred in Little Rock since the streetcar became operational in 2004 and Memphis has seen similar activity with a considerable increase of the downtown residential base with over 20,0000 new residents since the streetcar commenced operations in 1993 (Wilson, 2006). Both transit agencies have been conducting long range planning with the possibility of light rail service to their respective airports thereby increasing the prospects for a broader scope of transit-oriented development in both markets (Lancaster, 2009; Meyerson, 2009). By developing in-house real estate expertise, the transit agencies will be better equipped to assist on the complexities of land assemblages, zoning support and transit integration.

"Transit drives development and public investment in transit encourages a walkable urbanism" (Leinberger, 2008, p. 163), a goal of both study sites. Collaboration among all of the stakeholders can lead to mutually beneficial goals and objectives with streetcar-oriented developments. In addition to generating higher levels of ridership, streetcar-oriented developments can help promote active environments. By helping define and shape compact neighborhoods, streetcars and compatible developments enhance the residential experience of the residents by providing a distinctive urban amenity. Because streetcars are about the pedestrian as much as public transit, they are effective place making tools that help shape neighborhoods into walkable environments (Taylor, 2008). By effectively planning the connectivity of the streetcar and the adjacent developments, real estate developers and planners can encourage residents toward streetcar-oriented developments with a distinctive sense of place.

Research Limitations

It is commonly acknowledged that all survey strategies have limitations and the specific context of the subject group make it difficult to generalize the findings (Creswell, 2003; Marans, 1987). This study was confined to a mid-sized city (Little Rock/North Little Rock) and a large, metropolitan city (Memphis) in the South, two study sites that have similar spatial characteristics with their streetcar systems including a downtown circulator system and urban demand generators such as the extensive residential activity

near the streetcar lines. However, other cities will have unique market influences that affect the scope of development activity, price points and level of quality with residential units with related transit-oriented developments. The specific market characteristics of the study sites make the research specific to these study sites. Furthermore, the small sample size and the response rate of 28.5% also restrict the ability to generalize the findings to larger populations with other streetcar communities.

The survey was administered in November and December, two months that are typically not favorable for mailed surveys. Even though follow-up correspondence was utilized, competition with holiday mailings may have negatively affected the willingness of some of the sample to respond to the survey.

Another limitation is the possibility that the streetcar-oriented developments and neighborhoods attracted a certain type of individual that possessed a greater affinity for historic resources and neighborhood character prior to relocating to the subject properties of the research. Such a bias raises the possibility that some residents possessed strong feelings of neighborhood attachment based on preconceived attitudes of the community prior to reintroduction of streetcar service. However, there was no evidence that such a bias influenced the survey responses and follow-up interviews were carefully administered to focus upon the role of the streetcar as the central theme of the study.

Future Research

As an attempt to explore the relationship of heritage streetcars within the theoretical dimensions of community identity and social interaction, the study produced mixed results. Further research is needed to gain a deeper understanding of streetcar-

oriented developments as a form of transit-oriented development that retains an appropriate scale to the existing character of the Memphis and Little Rock/North Little Rock communities.

The physical design of some streetcar-oriented developments has approached a scale and massing that offers new opportunities for research. Residents' attitudes and perceptions towards the streetcar in established neighborhoods such as Argenta in North Little Rock as compared to newer, more vertical developments as in the central business core of Little Rock deserve a more thorough examination. The connectivity to street-level activity including streetcar access differs with the physical characteristics of the mid and high-rise developments as compared to former streetcar suburbs (Argenta) or the South Main Arts District in Memphis. In large markets, higher densities can efficiently support transit and help achieve sustainable urbanism (Farr, 2008). However, the design implications of increased verticality and non-traditional design themes while trying to retain streetcar sensibility has become a challenge in the downtowns of Memphis and Little Rock. The visual connectivity between streetcar-oriented developments and the streetscape with heritage streetcars as an integral part of the infrastructure is critical to ensure a walkable environment that promotes streetcar ridership. There is an emerging debate over "streetcar architecture" with new, mixed-use possessing some of the attributes of early twentieth century design including building placement on the sidewalk and upper-floor residential units over a ground floor retail space (Leeson, 2009). However, today's designs are taller with exterior materials that result in a design theme that can deviate considerably from the traditional two- and three-story buildings that lined

main streets when streetcars were at the height of their popularity. As pointed out by Carl Abbott, the noted urban historian and professor of planning and urban studies at Portland State University, "…the classic size was two and three stories. Now, we're getting five and six stories… It's the same but it's different. It's higher density than we had 75 or 100 years ago…" (Leeson, 2009). The challenge to develop streetcar-oriented buildings that have densities that fulfill a market need and support transit use while maintaining sensitivity to the scale of the streetcar would be meaningful research and provide insightful information for planners involved with design guidelines in areas serviced by streetcars.

Heritage streetcars play pivotal roles with the tourism strategies in both study sites. However, a number of cities that have started streetcar service or planning to do so have opted for modern streetcars such as in use in Portland and Seattle. Cost considerations and transit objectives are the overriding factors that determine whether modern or heritage streetcars are feasible for a particular market. An example of the cost differential is illustrated by the 2007 purchase by the City of Seattle of three Inekon modern streetcars for $8,042,064 or approximately $2.7 million per streetcar (Kimley-Horn, 2007). This compares to the recent purchase (2002–2006) of Gomaco Birney replica streetcars in Memphis, Little Rock and Tampa that ranged from $564,000 to $868,000 (Kimley-Horn, 2007). Planner and transit officials could benefit from comparative research regarding whether residents in modern streetcar-oriented communities held similar feelings of identity and attachment as residents in heritage streetcar communities. In cities such as Savannah with a significant heritage tourism

strategy, the choice is more obvious. However, other cities with priorities centered more on employment circulation, parking issues and alleviating traffic congestion, the choice is more difficult with long-range transit objectives weighed against cost considerations. Do modern streetcars also become a symbol for a community? Are there differences in the levels of distinctiveness and attachment between communities with heritage streetcars and those with modern streetcars?

Additional research is also needed to explore whether residents in modern streetcar communities ride streetcars more often and consider the service to be an essential mode of transit. It would be insightful to explore the perception of modern versus heritage streetcars as amenities or a transit mode that is vital to the travel behavior of the residents. Research that probed whether modern streetcars convey an impression of increased operating efficiency over heritage streetcars would useful information for planners and transit officials considering both options. There was a recurring theme of operating inefficiencies cited by residents in the heritage streetcar study sites. Research should measure whether modern streetcars are actually more efficient or whether there is a perception with the modern design that such systems do operate with more efficient schedules.

In recent years there has been increased literature devoted to the relationship of property values and public transit accessibility (Ryan, 1999). Much of the research has relied upon hedonic price modeling and matched-pair comparisons to measure the effects of transit proximity and rents or sale prices between areas near transit stations and similar areas without transit access (Cervero et al., 2002). However, much of the literature has

examined transit-oriented development with light and heavy-rail accessibility. There is an increased need to conduct similar research focused upon valuation, sale and rent comparisons and absorption effects with streetcar-oriented developments. Such research can be beneficial to the private sector with investors and real estate developers as well as the public sector seeking value-capture from streetcar projects.

Although it was unanticipated prior this study, it was revealed in follow-up interviews that streetcars also conveyed an image of security. The research revealed that residents who regularly walked or jogged along the streetcar route were cognizant of the streetcar schedule and felt a greater sense of security knowing it was a regular fixture of the streetscape. As noted by Jane Jacobs (1961) "….a person must feel personally safe and secure on the street…" and "…. there must be *eyes on the street* …" (Jacobs, 1961, p.33–35). Appleyard's *Livable Streets* (1981) also addressed residents' values and problems associated with streets with a study that ranked safety from crime as the highest priority (access to public transit was ranked third). Streetcars provide another means of providing eyes on the street and is an area worthy of future research to examine whether streetcars make a contribution of perceived and actual safety among the residents along the route.

Within the theoretical dimension of social interaction, the focus of this study was upon neighboring behavior, encounters with known acquaintances from the same neighborhood. The area of *civility* as expressed in terms of social interaction with strangers and the level of engagement resulting from streetcar-related activities is another area that should be explored with future research. David Brain (2005) notes that one of

the attractions of urbanism is derived from placemaking within a framework of civility that allows for individuals to connect to a common past while recognizing the "orderly contributions of others" (Brain, 2005, p.224). The social contributions of the streetcar resulting from the engagement of the residents with visitors and other unknown acquaintances with a form of civility is worthy of future research.

Today, roughly six million people live within ½ mile of an existing fixed-guideway transit stop. It is estimated that by 2030, the potential demand for housing near transit will be over 16 million households (Farr, 2008). Changing demographics that include aging baby boomers desiring to be closer to urban amenities, the emergence of "non-families" (households comprised of one individual or non-relatives) and the exponentially-increasing number of foreign-born residents will all have a significant market influence upon urban areas and all forms of transit-oriented development, including housing near streetcar systems. The exploratory nature of this study may lead to further research that was unanticipated but continues to emerge with the increasing momentum of heritage streetcars and provides opportunities to illuminate the market forces that guide buyer motivations and spur appropriate planning and development practices related to future streetcar-oriented developments.

APPENDICES

Appendix A

Cities with Heritage Streetcar Systems

Year Built	City	Customer	Desc.	Builder	Number of Cars	Cost	Length	Weight	Seats
1984	Lowell, Mass.	NPS	15-Bench open car	Gomaco	2	$270K	43' 6"	34,000	15 bench
1986	Tampa	Gomaco	15-Bench open car	Gomaco	1	---	43' 6"	34,000	15 bench
1987	Lowell, Mass.	NPS	Semi-convertible	Gomaco	1	$290K*	39' 8"	38,000	40
1987	Galvestor	Galveston Park Board	Diesel-electric	iner Rail	4	$600K	41' 9"	63,000	40
1988	Denver	DRHS	Diesel	Gomaco	1	$350K	43' 6"	---	15 bench
1991	Portland	Tri-Met	Council Crest	Gomaco	4	$504K	40'	55,000	40
1993	Memphis	MATA	Single-truck	Gomaco	1	---	30'	24,400	24
1997	New Orleans	RTA	Perley Thomas	RTA	6	~ $900K	47' 8"	---	40
1999	New Orleans	RTA	Perley Thomas	RTA	1	---	47' 8"	---	40
2000	Tampa	HARTline	Double-truck Birney	Gomaco	8	$620K	46' 1"	43,000	48
2001	San Pedro	Port of LA	PE 500	POLA	2	$1.2M	43'	58,500	48
2001	Los Angeles	The Grove	Double deck battery tram	Eng. / T.	1	$1M	31' 8"	53,300	70
2001	Little Rock	CAT	Double-truck Birney	Gomaco	3	$755K	44' 6"	48,500	40
2002	New Orleans	RTA	Perley Thomas	RTA	23	$1.3M	47' 6"	48,000	40
2002	Memphis	MATA	Double-truck Birney	Gomaco	1	$564K	47' 10"	46,000	48
2003	Charlotte	CATS	Double-truck Birney	Gomaco	3	$716K	44' 6"	48,500	40
2005	Tampa	HARTline	Double-truck Birney	Gomaco	1	$634K	46' 1"	43,000	48
2006	Little Rock	CAT	Double-truck Birney	Gomaco	2	$868K	44' 6"	48,500	40
				Total:	65				

Source: Kimley-Horn and Associates, Inc.—*Peachtree Streetcar: Evaluation of Technical and Operational Issues*, October, 2007.

Appendix B

Map of Existing and Planned Streetcar Systems
(Reprinted with Permission from Yonah Freemark, Infrastructurist: http://www.infrastructurist.com)

Appendix C

Cover Letter and Questionnaire

Ph.D. Program in Environmental Design and Planning
College of Architecture, Arts & Humanities
121 Lee Hall
P.O. Box 340511
Clemson, South Carolina 29634-0511

Respondent's name and address:

_____

_____

Dear _____:

I am contacting you to ask your help in an important research study. This study is being conducted for academic research to learn more about certain social aspects of living in close proximity to streetcar systems.

It is my understanding that you live in a development or neighborhood that is within walking distance to streetcar service. We are contacting residents of the streetcar-oriented neighborhoods and developments to complete a survey that addresses social interaction and community attachment related to streetcar service.

Results of the survey will be used to help city planners, developers and academic professionals learn more about desirable and undesirable aspects of living in streetcar-oriented communities. By gaining a better understanding of the social benefits and characteristics of the streetcar, public agencies and private developers can more effectively plan future streetcar systems and streetcar-oriented developments.

The survey is voluntary and your answers are completely confidential. The survey results will be used solely for academic purposes. Your help will be greatly appreciated by taking a few minutes to answer the survey questions and share your experiences of living

in a streetcar-oriented community. A stamped, self-addressed enveloped is enclosed to return the completed survey.

As a token of appreciation for helping with this survey (and with your consent), a small monetary donation will be made in your name to (determined by location: Argenta Downtown Council—North Little Rock; Historic Arkansas Museum—Little Rock; Memphis Heritage, Inc.).

Information Concerning Participation in a Research Study
Clemson University

The Reintroduction of Heritage Streetcars and the Related Effects of Enhanced Community Identity and Increased Social Interaction with the Residents in Streetcar-Oriented Developments

Description of the research and your participation

You are invited to participate in a research study conducted by Dr. Barry Nocks (Principal Investigator) and Robert Benedict (doctoral student). The purpose of this research is to learn more about certain social aspects of living in close proximity to streetcar systems.

Your participation will involve completion of a written survey.

The amount of time required for your participation will be approximately 20 to 30 minutes.

Risks and discomforts

There are no foreseeable risks or discomforts associated with this research.

Potential benefits

The results of the survey will enable academic professionals, planners and developers gain a better understanding of the social benefits and characteristics of the streetcar and the desirable and undesirable aspects of living in streetcar-oriented communities. The research findings may be helpful in planning future streetcar systems and streetcar-oriented developments.

Protection of confidentiality

We will do everything we can to protect your privacy. Your survey answers will be strictly confidential. All research data will be retained in a secure location during collection and analysis of the data. Following completion of the study, all surveys shall be destroyed. Your identity will not be revealed in any publication that might result from this study.

Voluntary participation

Your participation in this research study is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study.

Contact information

If you have any questions or concerns about your rights as a survey participant, please contact the Clemson University Office of Research Compliance at lmoll@clemson.edu, 864-656-6460, or toll free at 866-297-3071.

We greatly appreciate your help with this important research study.

Sincerely,

Robert C. Benedict
Ph.D. Candidate in Environmental Design and Planning
College of Architecture, Arts and Humanities
Clemson University
121 Lee Hall
Box 340511
Clemson, SC 29634-0511

CLEMSON
UNIVERSITY

Streetcar-Oriented Development Survey
2008

ID (to be completed by researcher) _____

Date (to be completed by respondent) _____

Development/Neighborhood Code (to be completed by researcher)
_____

Heritage streetcars have been reintroduced in your city as an alternative mode of public transit. As compared to public buses and other means of public transit, streetcars operate on stationary tracks with a fixed route. Heritage streetcars are either restored historic trolley cars or replica streetcars that closely resemble the historic streetcars that operated in your community during the early decades of the twentieth century. The purpose of this survey is to explore social aspects of the streetcar among the residents living in close proximity to streetcar service. As a resident in a streetcar-oriented development, your participation will provide valuable research information.

1. What year were you born? _____

2. Do you own or rent your home or apartment? *(Please check one)*

   ☐ Own

   ☐ Rent

3. Are you head or co-head of the household?

   ☐ Yes

   ☐ No

4. Do you have children that reside with you?

   ☐ Yes

   ☐ No

5. How many adults (including you) and children reside in your household?

   ____ Number of adults (including you)

   ____ Number of children (17 or under)

6. a. What is the name of your development or neighborhood?

_____

b. How long have you lived in this development or neighborhood? *(Please check one)*

- ☐ 6 months or less
- ☐ 7 months to 1 year
- ☐ 1 year to 3 years
- ☐ 4 to 10 years
- ☐ More than 10 years

7. What was the name and city of the development or neighborhood where you previously lived?

Neighborhood or development name _____

City and state _____

8. What is your annual household income?

- ☐ Under $24,999
- ☐ $25,000 to $44,999
- ☐ $45,000 to $74,999
- ☐ $75,000 to $99,999
- ☐ $100,000 to $249,000
- ☐ Over $250,000
- ☐ I do not wish to answer

9. Please indicate the extent to which you agree or disagree with the following statements *(Please circle a response for each statement)*:

Statement	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	Don't Know or Not Applicable
I feel more attachment to my current neighborhood than where I previously lived.	1	2	3	4	5	DK
Streetcars make my neighborhood more distinctive than other neighborhoods.	1	2	3	4	5	DK
Streetcars are a symbol of my neighborhood.	1	2	3	4	5	DK
Streetcars convey a sense of pride in my neighborhood.	1	2	3	4	5	DK
Streetcars connect me with the history of my community.	1	2	3	4	5	DK
I am more involved in my neighborhood association or homeowners association than where I previously lived.	1	2	3	4	5	DK
People in my neighborhood are friendlier than where I previously lived.	1	2	3	4	5	DK
Having the streetcar within walking distance influenced my decision to buy or rent in my neighborhood.	1	2	3	4	5	DK
My neighborhood or development promotes accessibility to the streetcar in its marketing material.	1	2	3	4	5	DK

Statement	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	Don't Know or Not Applicable
The person I bought or rented my residence from told me about the streetcar before I made my decision to move here	1	2	3	4	5	DK

10. Within the last 30 days how often have you participated in the following activities? *(Please circle a response for each activity)*:

Activity	None	1 to 3 times	4 to 10 times	11 to 25 times	More than 25 times	Don't Know Or Not Applicable
Rode a streetcar in my city	1	2	3	4	5	DK
Used other types of public transit such as the bus or train in my city	1	2	3	4	5	DK
Talked with a neighbor I already knew while walking to or waiting for a streetcar	1	2	3	4	5	DK
Talked with a neighbor I already knew while riding on a streetcar	1	2	3	4	5	DK
Made specific plans to meet later with a neighbor I already knew while riding on a streetcar (e.g., for lunch, coffee, exercise, etc.)	1	2	3	4	5	DK
Talked with someone I didn't know from my neighborhood while walking to or waiting for a streetcar	1	2	3	4	5	DK

Activity	None	1 to 3 times	4 to 10 times	11 to 25 times	More than 25 times	Don't Know Or Not Applicable
Talked with someone I didn't know from my neighborhood while riding on a streetcar	1	2	3	4	5	DK
Made specific plans to meet later with someone I didn't know from my neighborhood while riding on a streetcar (e.g., for lunch, coffee, exercise, etc.)	1	2	3	4	5	DK

11. a. Do you currently belong to a homeowners association or neighborhood association? *(Please check one*)

- ☐ Yes
- ☐ No
- ☐ Not sure

b. Did you belong to a homeowners association or neighborhood association where you previously lived? *(Please check one)*

- ☐ Yes
- ☐ No
- ☐ Not sure

12. a. Which of the following social organizations and/or volunteer activities have you joined or participated in since living at your current address that you were not previously a member of at your old address? *(Please check all that apply)*

- ☐ None (Skip to Question 8)
- ☐ Parents Teachers Association (PTA)
- ☐ Other school-related volunteer activity
- ☐ Church
- ☐ Church-related volunteer activity
- ☐ Civic-related volunteer activity
- ☐ Neighborhood-based volunteer activity

☐ Youth sports-related volunteer activity

☐ Museum

☐ Country club

☐ Performing arts organization such as the symphony, ballet, or theatre

☐ Environmental organization

☐ Historic organization

☐ Dining or wine tasting organization

☐ Walking, running, biking, or fitness club

☐ Other _____

c. How many times have you encountered a neighbor at a function of the organizations/activities you checked above within the past 30 days? *(Please check one*)

☐ 0 times

☐ 1 to 3 times

☐ 4 to 10 times

☐ 11 to 25 times

☐ More than 25 times

d. How many times did you ride the streetcar to a function of the organizations/activities you checked above within the past 30 days? *(Please check one*)

☐ 0 times

☐ 1 to 3 times

☐ 4 to 10 times

☐ 11 to 25 times

☐ More than 25 times

13. a. How many times did you ride the streetcar to a sporting event, concert, or show within the past year? *(Please check one*)

☐ 0 times *(Skip to Question 9)*

☐ 1 to 3 times

☐ 4 to 10 times

☐ 11 to 25 times

☐ More than 25 times

b. Who did you ride on the streetcar with to the sporting event, concert, or show? *(Please check one*)

☐ No one *(Skip to Question 9)*

☐ Family

☐ Friends

☐ Family and friends

☐ Organized group/club/school/educational group

☐ Other (please specify): _____

c. Were the people you rode on the streetcar with to the sporting event, concert, or show a neighbor? *(Please check one)*

☐ Yes

☐ No

☐ Not sure

14. Which of the following destinations have you ridden the streetcar to within the past 30 days *(Please check all that apply)*:

☐ Place of employment

☐ Restaurant

☐ Retail shop

☐ Grocery store

☐ Museum

☐ Theatre

☐ Movie

☐ Nightclub

☐ A friend or relative's residence

☐ Library

☐ Festival or parade

☐ Other _____

15. a. Are you presently employed outside of your home? *(Please check one*)

☐ Yes

☐ No

b. Is your place of employment convenient to a streetcar stop? *(Please check one)*

☐ Yes

☐ No

☐ Not sure

c. How often have you used the streetcar to commute to your place of employment within the past 30 days? *(Please check one)*

☐ 0 times (Skip to Question 11)

☐ 1 to 3 times

☐ 4 to 10 times

☐ 11 to 25 times

☐ More than 25 times

d. Would you consider your current use of the streetcar to commute to your place of employment to be more, less, or about the same as compared to previous months? *(Please check one)*

☐ More

☐ Less

☐ About the same

☐ Not sure

16. Do you consider the streetcar to be an amenity to your place of residence?

☐ Yes

☐ No

☐ Not sure

17. Do you consider the streetcar do be an essential mode of transportation for you?

- ☐ Yes
- ☐ No
- ☐ Not sure

18. When you ride the streetcar, what type of fare do you usually pay?

- ☐ Single trip fare
- ☐ Daily fare (unlimited daily use)
- ☐ Multiple day pass
- ☐ Monthly pass
- ☐ Not sure

19. Please indicate for each of the following items how much more or less likely you will use a streetcar instead of another means of travel. *(Please circle one response for each item)*:

Factor	Much less likely	Less Likely	Neither less nor more likely	More likely	Much more likely	Don't Know or Not Applicable
Not having a vehicle available for my use	1	2	3	4	5	DK
Not having to drive	1	2	3	4	5	DK
Dealing with traffic	1	2	3	4	5	DK
Saving money on gas	1	2	3	4	5	DK
Being able to ride with friends	1	2	3	4	5	DK
Environmental considerations	1	2	3	4	5	DK
Not paying to park	1	2	3	4	5	DK
Opportunity to meet new people	1	2	3	4	5	DK
Sightseeing or looking out the window	1	2	3	4	5	DK
Leisurely speed of the streetcar	1	2	3	4	5	DK
Walking to the	1	2	3	4	5	DK

streetcar stop						
Factor	**Much less likely**	**Less Likely**	**Neither less nor more likely**	**More likely**	**Much more likely**	**Don't Know or Not Applicable**
Friendliness of the streetcar operator	1	2	3	4	5	DK
Hours of operation for the streetcar	1	2	3	4	5	DK
Time for the streetcar to get to my destination	1	2	3	4	5	DK
Waiting time for arrival of the streetcar to stop	1	2	3	4	5	DK
Location of the streetcar stops	1	2	3	4	5	DK
The amount of the fare	1	2	3	4	5	DK
Riding with other people on the streetcar	1	2	3	4	5	DK
Socializing with other people	1	2	3	4	5	DK

20. To what extent do you like or dislike the following characteristics of the streetcar and the streetcar route *(Please circle a response for each item)*:

Characteristic	**Dislike**	**Somewhat dislike**	**Neither dislike nor like**	**Somewhat like**	**Like**	**Don't know or not applicable**
Historic appearance of the streetcar	1	2	3	4	5	DK
Speed at which the streetcar travels	1	2	3	4	5	DK
Interior of streetcar (e.g., woodwork, detailing, decorations)	1	2	3	4	5	DK
Arrangement of seats	1	2	3	4	5	DK

Comfort of seats	1	2	3	4	5	DK
Location of the streetcar stops	1	2	3	4	5	DK
Friendliness of the streetcar operator	1	2	3	4	5	DK

Characteristic	**Dislike**	**Somewhat dislike**	**Neither dislike nor like**	**Somewhat like**	**Like**	**Don't know or not applicable**
Sounds made by the streetcar	1	2	3	4	5	DK
Length of wait for the streetcar	1	2	3	4	5	DK
Placement of the streetcar tracks in the road	1	2	3	4	5	DK
Signage at the streetcar stops	1	2	3	4	5	DK
Route of the streetcar	1	2	3	4	5	DK
Advertising	1	2	3	4	5	DK
Windows or window openings	1	2	3	4	5	DK
Historical information provided about the streetcar	1	2	3	4	5	DK
Overhead electrical lines	1	2	3	4	5	DK
Ability to get on and off of the streetcar	1	2	3	4	5	DK
Others: (*please specify*)	1	2	3	4	5	DK
	1	2	3	4	5	DK
	1	2	3	4	5	DK

21. May we contact you in the near future for a short telephone interview to further help with this study? Your participation would still remain confidential and would greatly help us further understand the importance of streetcars in your neighborhood. (*Please check one*)

☐ Yes, I'd be happy to help

If yes, please provide your name and phone #

_____

☐ No, please do not contact me for an interview

22. In appreciation of your time taking this survey, a donation of $5 shall be made in your name to Memphis Heritage, Inc. If you are agreeable to such a donation, please provide your name and address below. In lieu of a donation, please indicate below if you would like the donation to be anonymous.

Name:_____

Address: _____

☐ Please make the donation anonymously.

Thank you for participating in this survey. Your participation is greatly appreciated and will provide valuable research information.

Appendix D

Follow-Up Interview Format for Real Estate Developers and Related Professionals

Interview Format for Developers of Streetcar-Oriented Projects

Name:_____ Date: _____

Title: _____

Development Firm:_____

Address: _____

Phone: _____

E mail: _____

1. What types of residential, streetcar-oriented developments has your firm completed?

Name and Type of Development	Size (# of units)

2. What are some of the factors* that significantly affected your firm's willingness to develop the above-referenced projects?

*Such as;

Accessibility to streetcar service as a means of public transit
Accessibility of streetcars as an amenity for the residents of the project
Potential for higher sale prices or rent premiums
Transit-oriented development zoning incentives*
Complimentary real estate development activity along the streetcar lines

3. Are there other streetcar-oriented developments that influenced your decision to proceed with your streetcar-oriented development (s) and if so how did they influence your decision?

4. As a developer of a streetcar-oriented project or projects, what was your experience collaborating with the transit agency?

5. As a developer of a streetcar-oriented project or projects, what was your experience collaborating with local officials such as planning staff and elected officials?

6. What public policies or actions by the above-referenced entities helped facilitate the development of your streetcar-oriented project (s)?

7. Please share any other ideas you may have to improve the collaboration between streetcar-oriented developers and your agency:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

8. What are your views regarding the streetcar as a symbol of community identity as it relates to the contextual image of your streetcar-oriented development (s)?

_____
_____
_____
_____
_____
_____
_____
_____
_____

9. What are your views regarding the streetcar as a means of promoting social interaction among the residents in your streetcar-oriented developments?

10. What is your perspective of the streetcar as an amenity to the residents of your streetcar-oriented developments?

11. Questions # 9 (h), 9 (i) and 9 (j) of the survey revealed that respondents are more or less likely to use the streetcar instead of other means of travel.
    a. Review data – (h) influenced decision to buy or rent, (i) development promoted accessibility to streetcar in the marketing material, (j) seller told me about the streetcar prior to deciding whether to buy or rent

Comments:

_____

_____

_____

_____

_____

_____

12. Questions #20 (f), 20 (i) and 20 (l) of the survey revealing the following data regarding what the respondents liked or disliked about the characteristics of the streetcars.
    a. Review data – location of streetcar stops (f), wait (i) and route (l).

Comments:

_____

_____

_____

_____

_____

_____

_____

13. What barriers or negative aspects related to the streetcar system had an adverse impact upon your development plans?

Comments:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

THANK YOU FOR YOUR TIME AND ASSISTANCE

Appendix E

Follow-Up Interview Format for Planners and Transit Managers

Interview Format for Planners/Transit Agency Officials

Name: _____ Date: _____

Title: _____

Agency: _____

Address: _____

Phone: _____

E mail: _____

1. How is transit-oriented development encouraged along the streetcar lines? Are there formal or informal programs currently in use?

_____

_____

_____

_____

_____

_____

_____

_____

_____

2. How does your agency collaborate with developers on transit-oriented developments?

3. Please share any other ideas you may have to improve the collaboration between streetcar-oriented developers and your agency:

4. What characteristics of the streetcar-oriented developments have been effective demand generators for increased streetcar ridership among the affected residents?

5. Please tell me about the streetcar as a symbol of community identity as it relates to the image of the streetcar-oriented developments within your service area?

6. Please tell me about the streetcar as a means of promoting social interaction among the residents in streetcar-oriented developments within your service area?

7. Please tell me about the importance of the streetcar as an amenity to the residents of streetcar-oriented developments within your service area?

8. Question #____ of the survey
   revealed_____
   _____
   a. Review data

Comments:

_____
_____
_____
_____
_____
_____

9. Question # 20 of the survey revealing the following data regarding what the respondents liked or disliked about the characteristics of the streetcars.
   a. Review data

Comments:

_____
_____
_____
_____
_____
_____

10. What, if any, obstacles or negative aspects of the streetcar-oriented developments have limited the potential for greater ridership among the residents of the developments?

Comments:

_____

_____

_____

_____

_____

_____

_____

_____

THANK YOU FOR YOUR TIME AND ASSISTANCE

Appendix F

Follow-Up Interview Format for Survey Respondents

Interview Format for Respondents

Name: _____ Date: _____

Address: _____

Phone: _____

E mail: _____

1. What is it like to live in a streetcar-oriented development (neighborhood)?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

2. What are some aspects of living in a streetcar-oriented development (neighborhood) that you like or dislike that may not have been asked in the survey?

3. I noticed that you answered: (cite response)

Can you tell me more about this?

4. What are your views of the streetcar as an amenity to your development (neighborhood)?

THANK YOU FOR YOUR TIME AND ASSISTANCE

REFERENCES

Abbott, C. 1987. *Urban America in the Modern Age: 1920 to the Present*. Arlington Heights, IL: Harlan Davidson, Inc., 36.

Alexander, C., Ishikawa, S, & Silverstein, M. 1977. *A Pattern Language: Towns, Buildings, Construction*. New York: Oxford University Press.

Alonso, W. 1964. *Location and Land Use: Toward A General Theory of Land Rent*. Doctoral Dissertation, MIT, 149.

Appleyard, D. 1981. *Livable Streets*. Berkeley, CA: University of California Press, 49–51.

Arkansas Democrat (no listed author). "Little Rock's street car system has done much to aid in city's growth". 6 November 1921, page unknown.

Babbie, E. 2008. *The Basics of Social Research*. Belmont, CA.: Thomson Wadsworth, 303, 415-417.

Bagley, M. & Mokhtarian, P. 2002. The impact of residential neighborhood type on travel behavior: A structural equation modeling approach. *Annals of Regional Science*, 36.

Bello, M. 2009. "Public transit ridership hit record in '08". *USA Today*, 9 March 2009:3A.

Bernstein, S. 2007. How Streetcars Helped Build American Cities. In: *Street Smart Streetcars and Cities in the Twenty-First Century.* Edited by Gloria Ohland and Shelley Poticha. Oakland, CA: Reconnecting America, Inc., 18.

Boarnet, M. & Compin, N. 1999. Transit-oriented development in San Diego County. *Journal of the American Planning Association*, 65.

Boarnet, M. & Sarmiento, S. 1998. Can land-use policy really affect travel behavior? A study of the link between non-work travel and land-use characteristics. *Urban Studies*, 35.

Bernick, M. & Cervero, R. 1997. *Transit Villages in the 21st Century*. New York: McGraw–Hill Companies, Inc., 5-15 and 157-159.

Brain, D. 2005. From good neighborhoods to sustainable cities: Social science and the social agenda of the new urbanism. *International Regional Science Review*, 28.

Brown, J. L. "Special features editorials". *Arkansas Gazette*, 24 August 1947, unknown page.

Buckner, J. C. 1988. The development of an instrument to measure neighborhood cohesion. *American Journal of Community Psychology*, 16, 771-791.

Calthorpe, P. 1993. *The Next American Metropolis*. New York: Princeton Architectural Press, Inc., 48-56.

Calthorpe, P. 2004. Foreword to *The New Transit Town*. Washington, D.C.: Island Press, xii.

Calthorpe, P. & Fulton, W. 2001. *The Regional City*. Washington, D.C.: Island Press.

Cervero, R. 1998. *The Transit Metropolis*. Washington, D.C.: Island Press, 81-82.

Cervero, R. 2004. Effects of light and commercial rail transit on land prices: Experiences in San Diego County. *Journal of the Transportation Research Forum*, 43.

Cevero, R. 1984. Light rail transit and urban development. *Journal of the American Planning Association*, 50.

Cervero, R. & Duncan, M. 2001. Rail transit's value-added: Effects of proximity to light and commuter rail transit on commercial land values in Santa Clara, California. American Planning Association, *Institute of Urban ad Regional Development*, University of California, Berkeley, prepared for the Urban Land Institute and the National Association of Realtors, 1.

Cervero, Ferrell, R.C. & Murphy, S. 2002. Transit-oriented development and joint development in the United States: A literature review. *Research Results Digest*, Transit Cooperative Research Program, 52, 75-77.

Costello, D., Mendelsohn, R., Canby, A., and Bender, J. 2003. *The Returning City: Historic Preservation and Transit in the Age of Civic Revival*. Washington, D.C.: Federal Transit Administration, National Trust for Historic Preservation, 10.

Creswell, J. 2003. *Research Design: Qualitative, Quantitative, Mixed-Methods Approaches*. Thousand Oaks, CA.: Sage Publications, 148, 213 - 214.

Daisa, J. 2004. Traffic, parking, and transit-oriented development. In: *The New Transit Town*. Edited by Hank Dittmar and Gloria Ohland. Washington, D.C.: Island Press, 120.

Deakin, E., Chang, T. and Thomas, J. 2002. Policies and Practices for Cost-Effective Transit Investments: Recent Experiences in the United States, Washington, D.C.: Paper presented at the 81st Annual Meeting of the Transportation research Board.

Dickey, D. 2008. Evaluating Alignments: Charlotte Case Study. In: *Street Smart Streetcars and Cities in the Twenty-First Century.* Edited by Gloria Ohland and Shelley Poticha. Oakland, CA: Reconnecting America, Inc., 25.

Dillman, D. A. 2000. *Mail and Internet Surveys*. New York: John Wiley & Sons, Inc., 150-153.

Dittmar, H. & Ohland, G. 2004. *The New Transit Town*. Washington, D.C.: Island Press, 5-26.

Dorn, J. 2004. *Hidden in Plain Sight: Capturing the Demand for Housing Near Transit*. Oakland, CA: Center for Transit-Oriented Development.

Downs, A. 2004. *Still Stuck in Traffic: Coping with Peak Hour Traffic*. Washington, D.C.: Brookings Institution Press, 2.

Duany A., Plater-Zyberk, E. & Speck, J. (2000). *Suburban Nation*. New York: North Point Press.

Dunphy, R. T., Cervero, R., Dock, F. C., McAvey, M., Porter, D. R., Swenson, C. J. 2004. *Developing Around Transit: Strategies and Solutions That Work.* Washington, D.C.: Urban Land Institute, 20.

Ellis, C. 2001. Interstate highways, regional planning and the reshaping of metropolitan America. *Planning Practice & Research*, 16, 248-258.

Ehrlich, P. 2004. "A Sample of Little Rock Trolley Images". Retrieved on March 25, 2009 from http://world.nycsubway.org/us/littlerock/.

Farr, D. 2008. *Sustainable Urbanism*. Hoboken, New Jersey: John Wiley & Sons, Inc., 44, 116.

Farris, J. T. 2001. The barriers to using urban infill development to achieve smart growth. *Housing Policy Debate*, 12, 1, 6-8.

Fay, B. 1996. *Contemporary Philosophy of Social Science*. Malden, MA: Blackwell Publishers, 113–118.

Festinger, L., Schachter, S. M., & Black, K. 1950. *Social Pressures in Informal Groups*. Palto Alto, CA: Stanford University Press.

Fogelson, R. 2001. *Downtown: Its Rise and Fall*. New Haven: Yale University Press, 46.

Frank, L., Stephenson Smith, M. & Matthews, E. 1999. Assessing transit station area redevelopment: A case study of the Lindbergh Station in Atlanta. *Journal of Public Transportation*, 2, 32.

Fried, M. 1963. Grieving for a lost home. *The Urban Condition: People and Policy in the Metropolis*. Edited by Duhl, L.J., M.D. and Powell, J. New York: Basic Books, 156.

Frieden, B. J. 1964. *The Future of Old Neighborhoods*. Cambridge: MIT Press, 175 - 181.

Fry, V. 2009. Personal interview, Little Rock, Arkansas, March 20, 2009.

Fulton, W. 2001. Comment on J. Terrence Farris's "The barriers to using urban infill development to achieve smart growth". *Housing Policy Debate*, 12,1.

Gatzlaff, D. & Smth, M. 1993. The impact of the Miami Metrorail on the value of residences near station locations. *Land Economics*, 69, 54-66.

Glynn, T. J. 1986. Neighborhood and sense of community. *Journal of Community Psychology*, 14, 341-352.

Goodwill, J. & Hendricks, S. 2002. *Building Transit Oriented Development in Established Communities*. Tampa: Center for Urban Transportation Research, 14-15, 22.

Graeber, J. 2006. A history of the electric streetcar. In: *Street Smart Streetcars and Cities in the 21st Century*. Edited by Gloria Ohland and Shelley Poticha. Oakland, CA: Reconnecting America, Inc., 20-21.

Greenberg, E. 2004. Regulations shape reality: zoning for transit-oriented development. In: *The New Transit Town*. Edited by Hank Dittmar and Gloria Ohland.Washington, D.C.: Island Press, 66.

Greene, J. C., Caracelli, V. J., & Graham, W. F. 1989. Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis*, 11, 255-274.

Groat, L. & Wang, D. 2002. *Architectural Research Methods*. New York: John Wiley & Sons, Inc., 186.

Haig, R. 1926. Toward an understanding of the metropolis: The assignment of activities to areas in urban regions. *Quarterly Journal of Economics*, 40, 420-421.

Hayden, D. 2004. *A Field Guide To Sprawl*. New York: W.W. Lorton & Co., 12-16.

Hashas, M. H. 2004. *Residents' Attachment To New Urbanist Versus Conventional Suburban Developments*. Doctoral dissertation: North Carolina State University, 5.

Houston, E. J. 1896. *Electric Street Railways.* New York: The W.J. Johnston Company, 27.

Huang, H. 1996. The land-use impacts of urban rail transit systems. *Journal of Planning Literature*, 11, 17-50.

Hurd, R. M. 1924. *Principles of City Land Values*. New York: The Record and Guide, 11.

Jacobs, J. 1961. *The Death and Life of Great American Cities*. New York: Random House, Inc., 33–35.

Johnson, A. 2008, June 11. *Jampacked transit systems running on fumes*. Retrieved on February 17, 2009, from http://www.msnbc.msn.com/id/25010939/.

Jones, D. 2008. *Mass Motorization + Mass Transit*. Bloomington, Indiana: Indiana University Press, 88.

Kim, J. 2001. *Sense of Community in Neotraditional and Conventional Suburban Developments: A Comparative Case Study of Kentlands and Orchard Village*. Doctoral dissertation: The University of Michigan.

Kim, J. & Kaplan, R. 2004. Physical and psychological factors in sense of community: New urbanist Kentlands and nearby Orchard Village. *Environment and Behavior Journal*, 39, 315-316.

Kimley-Horn and Associates, Inc. 2007. *Evaluation of Technical and Operational Issues for the Peachtree Streetcar*. Atlanta: Kimley-Horn and Associates, Inc., 8-9.

Kitsinger, A. 2009. Personal interview, Memphis, Tennessee, 13 February 2009.

Ladd, B. 2008. *Autophobia*. Chicago: The University of Chicago Press, 155.

Lancaster, J. 2009. Personal interview, Memphis, Tennessee, 13 February 2009.

Lancaster, J. 2009. Personal interview, Memphis, Tennessee, 19 June 2009.

Landis, J., Guhathakurta, S., Huang, W. & Zhang, M. 1995. Rail transit investments, real estate values, and land use change: A comparative analysis of five California rail transit systems. Berkeley: University of California Transportation Center working paper no. 285.

Leeson, F. 2009, June 10. *Portland's streetcar architecture – past becomes future*. Retrieved June 16, 2009, from http://oregonlive.com/portland/index.ssf/2009/06/.html.

Leinberger, C. 2008. *The Option of Urbanism*. Washington, D.C. Island Press.

Lowenthal, D. 1985. *The Past is a Foreign Country*. Cambridge, Great Britain: Cambridge University Press, 389.

Lund, H. 2006. Reasons for living in a transit-oriented development, and associated transit use. *Journal of the American Planning Association,* 72, 364-365.

Lund, H. 2003. Testing the claims of new urbanism: Local access, pedestrian travel, and neighboring behaviors. *Journal of the American Planning Association*, 69.

Lynch, K. 1981. *A Theory of Good City Form.* Cambridge, MA: MIT Press, 1981.

Mallach, S. 1996. The origins of the decline of urban mass transportation in the United States, 1890–1930. In: *American Cities, A Collection of Essays*. New York: Garland Publishing.

Marans, R. 1987. Survey research. In: *Methods in Environmental and Behavioral Research*. Edited by Bechtel, R., Marans, R., Michealson, W. New York : Van Nostrand Reinhold.

Marris, P. 1996. *The Politics of Uncertainty: Attachment in private and public life.* New York: Routledge.

Memphis Area Transit Authority. 2007. PowerPoint presentation *Downtown Trolley System*, May 2007.

Memphis Service News (no listed author). "Mr. McWhorter tells Engineers Club the story of street railway progress". 15 March 1927, 1-2.

Memphis Press (no listed author). "26 new buses are purchased". 12 June 1947, 1.

Middleton, W. D. 1967. *The Time of the Trolley*. Milwaukee: Kalmbach Publications, 77-86.

Mohl, R. 1985. *The New City Urban America in the Industrial Age, 1860 – 1920.* Arlington Heights, Illinois: Harlan-Davidson, Inc., 29-30.

Morse, J. M. 1991. Approaches to qualitative-quantitative methodological triangulation. *Nursing Research*, 40, 120-123.

Mumford, L. 1961. *The City in History*. New York: Harvest Books.

Ng, S. H. 2006. *Intelligent Transportation Systems: Research Projec –Evaluation of Real Time Technology In Portland Streetcar*. Portland State University, posted on http://portlandtransport.com/archives/2007/05/Nextbus.html.

Ohland, G. & Poticha, S. 2007. *Street Smart: Streetcars and Cities in the Twenty-First Century*. Oakland: Reconnecting America, 51-52.

Park R., Burgess, E. W. & Mckemzie, R .D. 1925. *The City*. Chicago: University of Chicago Press.

Podobnik, B. 2002. New urbanism and the generation of social capital: Evidence from Orenco Station. *National Civic Review*, 91, 245-256.

Poticha, S. & Ohland, G. 2007. Why streetcars and why now? *Street Smart: Streetcars and Cities in the Twenty-First Century*. Edited by Gloria Ohland and Shelley Poticha. Oakland, CA: Reconnecting America, Inc., 2 - 3.

Puentes, R. 2008. *A Bridge to Somewhere: Rethinking American Transportation for the 21st Century*. Washington, D.C.: Brookings Institution, Metropolitan Policy Program.

Punch, Keith F. 2005. *Introduction To Social Research*. Thousand Oaks, CA.: Sage Publications, Inc., 168-169.

Putnam, R. 2000. *Bowling Alone: The Collapse and Revival of American Community.* New York: Simon & Schuster.

Relph, R. E. 1976. *Place and Placelessness*. London: Pion Limited.

Rowsome, Frank. 1956. *Trolley Car Treasurer.* New York: Bonanza Books, 81.

Ross, C. L. & Dunning, A. 1997. *Land Use Transportation Interaction: An Examination of the 1995 NPTS Data.* Washington, D.C.: Federal Highway Administration.

Rothenbuhler, E., Mullen, L. J., DeLaurell, R. & Ryu, C. R. 1996. Communication, community attachment, and involvement. *Journalism & Mass Communication Quarterly*, 73, 445-464.

Ryan, S. 1999. Property values and transportation facilities: Finding the transportation–land use connection. *Journal of Planning Literature*, 13, 22-23.

Sachs, D. "The city's desire is named streetcar". *Alexandria Times* 24 July 2008: Retrieved from http://www.alextimes.com/article.asp?article=10634.

St. Clair, D. 1986. *The Motorization of American Cities*. New York: Prager Publishers, 13-18, 171.

Schweiger, C. 2003. *A Real-Time Bus Arrival Information Systems: A Synthesis of Transit Practice*. Transit Cooperative Research Program. Transportation Research Board of the National Academies.

Seashore Trolley Museum. (unknown date). Retrieved February 15, 2008, from http://www.heritagetrolley.org/existMemphisOverview.htm.

Singleton, R. A. & Straits, B. C. 2005. *Approaches To Social Research*. New York: Oxford University Press, 37.

Smatlak, G. 2006. Little Rock vintage trolley. Retrieved February 14, 2008, from http://www.railwaypreservation.com/vintagetrolley/littlerock.htm.

Smerk, G. 1967. The streetcar: Shaper of American cities. *Traffic Quarterly*, 21, 79-91.

Stern, R. A. 1981. *The Anglo American Suburb*. London: Architectural Design.

Talen, Emily. 2000. The problem with community in planning. *Journal of Planning Literature*, 15, 172.

Taylor, D. 2007. Place Making and People Moving. In: *Street Smart Streetcars and Cities in the 21st Century*. Edited by Gloria Ohland and Shelley Poticha. Oakland, CA: Reconnecting America, Inc., 23.

Transportation Research Board of the National Academies. 2004. *TCRP (Transit Cooperative Research Program) Report 102- Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects.* Washington, D.C.: Transportation Research Board, sponsored by the Federal Transit Administration, 7-10, 119, 129, 457.

Twigger-Ross, C. L. & Uzzell, D. 1996. Place and identity processes. *Journal of Environmental Psychology*, 16, 205-220.

United States Census Bureau. 2007. Population Finder—American FactFinder. Retrieved on March 25, 2009, from http://factfinder.census.gov.

Voith, R. 1991. Transportation, sorting, and house values. *American Real Estate and Urban Economics Association Journal*, 19, 117-137.

Vuchic, V. 2005. *Urban Transit: Operations, Planning, and Economics.* Hoboken, NJ: John Wiley & Sons, Inc.

Warner, S. 1978. *Streetcar Suburbs: The Growth Process of Boston*. Cambridge, MA: Harvard University Press, 8.

Weyrich, P. M. & Lind, W. S. 2002. *Bring Back the Streetcars! A Conservative Vision of Tomorrow's Urban Transportation*. Washington, D.C.: The Free Congress Foundation, 8.

Weyrich, P. M. & Lind, W. S. 2008. Why conservatives should want streetcars. *Street Smart Streetcars and Citie in the 21st Century*. Edited by Gloria Ohland and Shelley Poticha. Oakland, CA: Reconnecting America, Inc., 8 - 9.

Wilson, D. 2006. *Making Streetcars Happen: A Guide to the Implementation of Community Streetcar Systems*. Master's Thesis, University of Illinois at Chicago, 20, 74-76.

Wingo, Jr. L. 1961. *Transportation and Urban Land*. Washington, D.C.: Resources for the Future, 91.